Better Homes and Gardens®

WOOD®

THE #1 MAGAZINE FOR HOME WOODWORKERS

INDEX
Projects, tips, techniques from issues 25 through 32

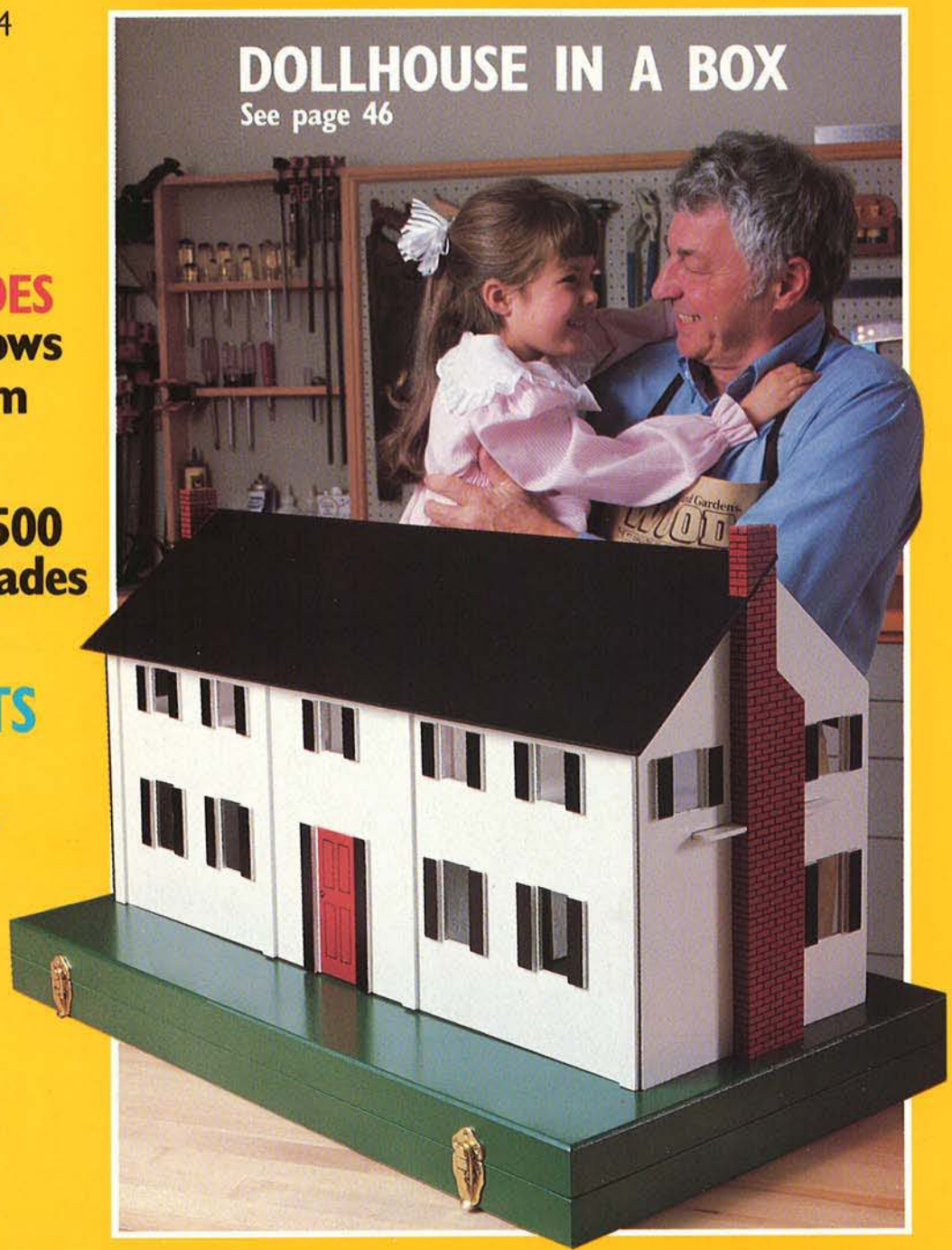
APRIL 1990 • ISSUE NO. 34
Display until April 12

SANDBLASTING
Tested ways to dress up projects

BIRCH-BARK CANOES
Jack Minehart shows how to build them

TOOL SPECIAL
- **Planers under $500**
- **Thin-kerf saw blades**
- **Scrollsaw blades**

SUPER PROJECTS
Tablesaw base
Sandblasted clock
Bowed psaltery
Hummingbird sculpture
Carved bluegill



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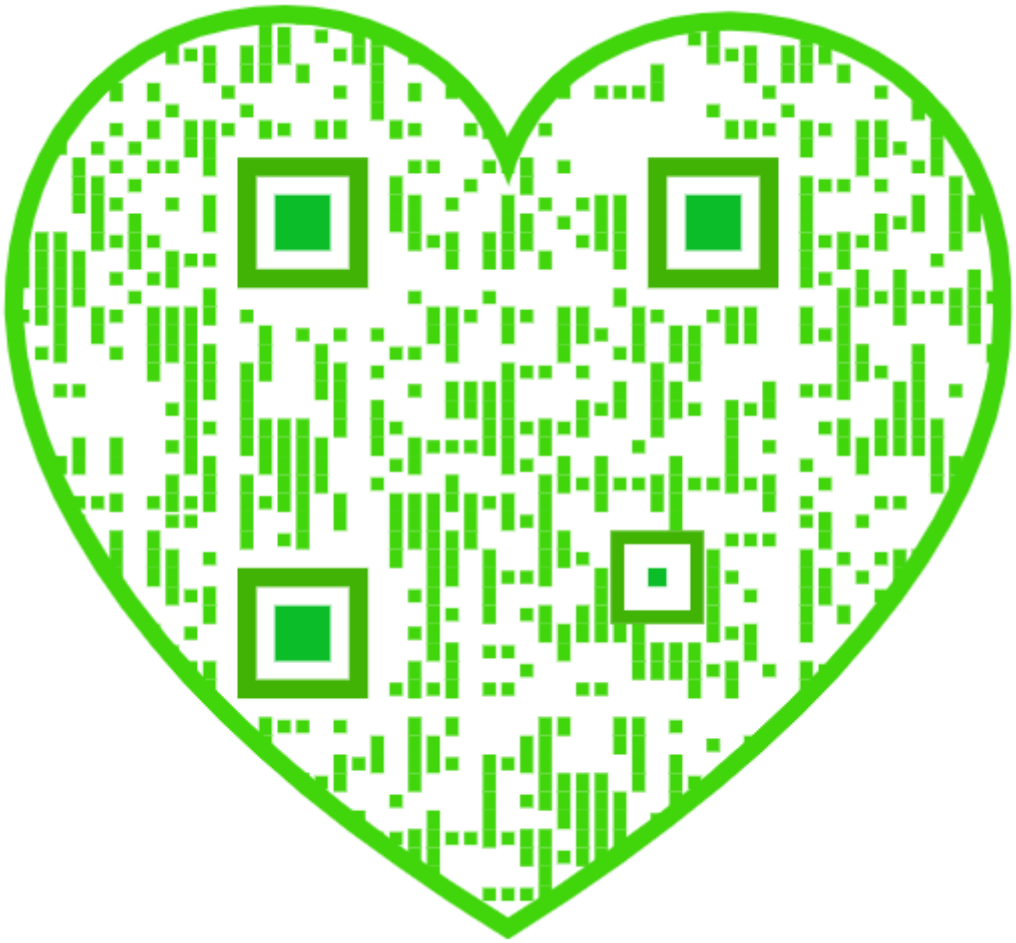

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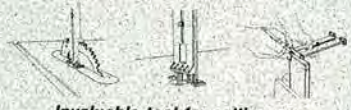

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D / Band Saw Handbook *by Mark Duginske*
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16L04.02 Band Saw Handbook $16.95

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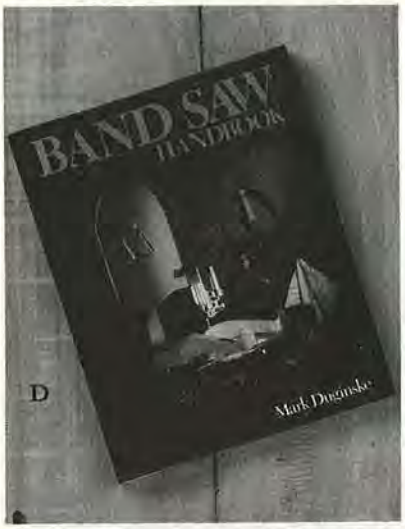

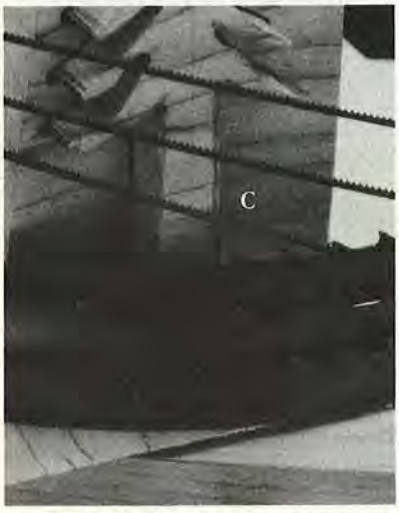

C / Garrett Wade Has Discovered Some Very Interesting Bandsaw Blades

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33K12.02	¼" Cabinet	$10.00
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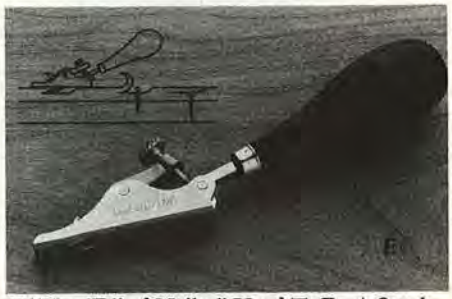
710.201	¼" Cabinet	$11.95
710.202	½" Cabinet	$12.90



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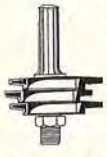

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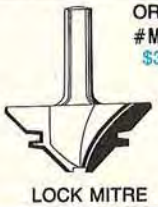

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This issue's cover wood grain: mesquite

APRIL 1990 ISSUE NO. 34

WOOD PROFILE

Red oak: From men-of-war to kitchen cabinets, always number one 27

In our first expanded coverage of wood species, we lay out a bundle of information about a favorite wood of cabinetmakers.

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Long live the bark canoe! 29

Features Editor Pete Stephano poked around Max, Minnesota, for a few days last summer to watch Jack Minehart build genuine birch-bark canoes. You'll see how Jack's caring process clings to historical craftsmanship.

SHOP-TESTED TECHNIQUES

Sandblasting—try it once and you'll be blown away 34

The research for this article really opened our eyes to an untapped area of woodworking. We'll bet dollars to doughnuts that most readers have no idea how easily they could sandblast interesting details into their projects.

NOW YOU CAN BUILD IT

Sandblasted wall clock 40

To mirror the versatility of your newly acquired techniques, here's a clock design that allows you lots of sandblasting variations.

IN SEARCH OF THE PERFECT FINISH

Water-based lacquers: the safe finish that goes on fast 42

In suburban Chicago, a refinisher breathes easier now that he has switched to water-based lacquer. It makes sense for the environment, too.

TOOL BUYMANSHIP

Thin-kerf showdown 44

You, too, may have noticed a lot of advertisements promoting 10" thin-kerf blades. Our tests show a wide variety in the quality of cuts.

Dollhouse in a box 46

By designing a two-story house that collapses neatly into a carrying case, we've taken care of the #1 problem with a dollhouse—where to keep it when playtime ends. You'll get lots of requests to build this one.

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You'll find it all easily in our pull-out, eight-issue index: projects, shop techniques, tool reviews, features, and more.

THE WOODWORKER'S SURVIVAL GUIDE TO BUYING...

Scrollsaw blades 56

Choosing the right scrollsaw blade perplexes many woodworkers. Here's information you need before placing your order.

Petal-powered sculpture 58

When we saw this hummingbird design at an Arkansas craft show, our entire staff agreed that it had all the makings of a perfect project for pattern-hungry scrollsaw users.

Customized tablesaw base 60

Our latest shop helper not only allows for dust evacuation, it also features storage nooks for your miter gauge, rip fence, saw blades, and push stick.

TOOL BUYMANSHIP

Thickness planers under $500 64

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The bowed psaltery 68

With the expert guidance of instrument makers from St. Croix Kits, we offer a stringed musical instrument with roots in the Renaissance.

CARVING PATTERN

Carve a bluegill 74

Wisconsin's Rick Beyer, who wins acclaim with his realistic fish carved from cherry, shares his design for one of the Heartland's favorite catches.

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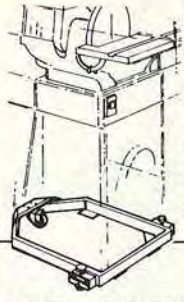

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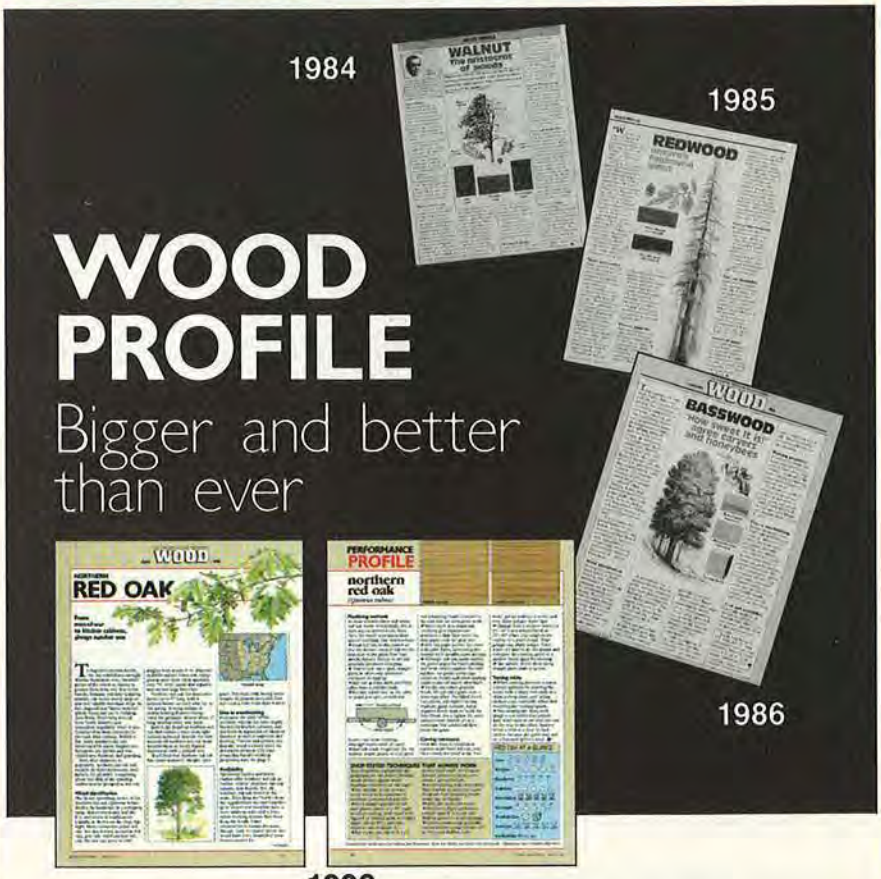
THE EDITOR'S ANGLE



When the English naturalist Charles Darwin advanced the theory of evolution more than a century ago, he focused on man and animals, not publications. But I think he would nod in approval at what's happening with the new "Wood Profile" you'll find on page 27.

Because I'm responsible for this feature's production, Editor Larry Clayton asked me to explain what's going on. That's why—for this issue—I've taken over his column.

Magazines always undergo some change, and of course we've made changes to "Wood Profile" in the past. This time, though, we've pulled out all the stops for an evolutionary leap, as shown *above*.

As you can see, we've altered the looks of this popular feature. And to help more in identification, we've included an up-close illustration of the tree's leaves—with blooms and nuts if they're pertinent. The whole tree is still there, but it's smaller to allow room for a map that shows where it grows. Nice, but nothing earthshaking. So, turn (Surprise!) to the *next* page.

Starting with this issue, we've bumped "Wood Profile" up to two pages. On the second page, you'll learn more about how the featured species reacts in the shop. From planing and gluing to carving, turning, and finishing, we've tapped the experience of several experts. And, although we will be covering in the new, expanded way some old favorite woods we've included before, you can expect to see some new species, too. Even if you've been working wood for 20 years or more, we trust there's a new tip or two to pass on to you. Our goal is to improve your woodworking skills. That's what evolution does, you know—improve things.

Peter J. Stephano
Features editor

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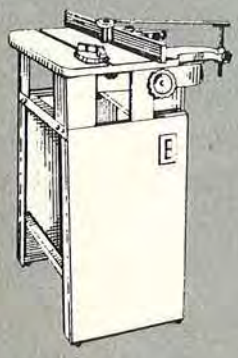

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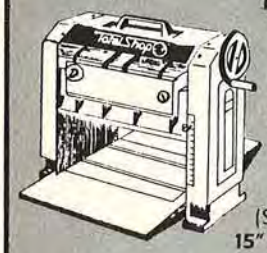

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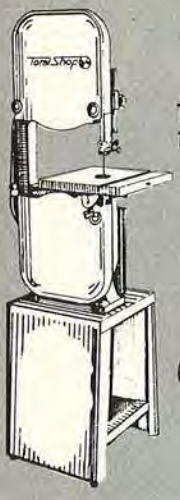

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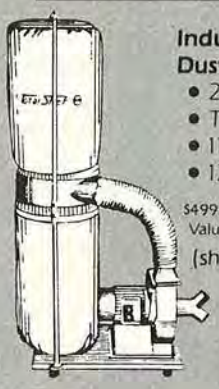

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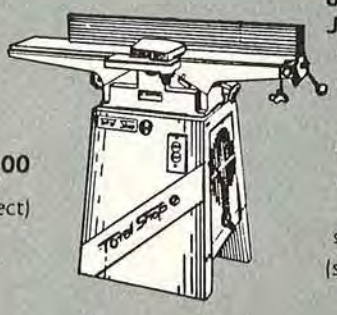

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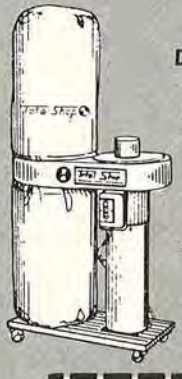

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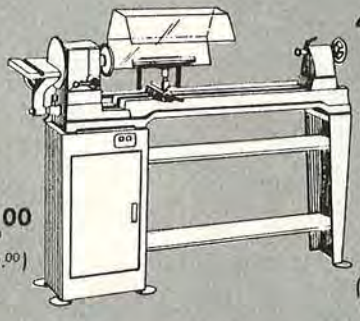

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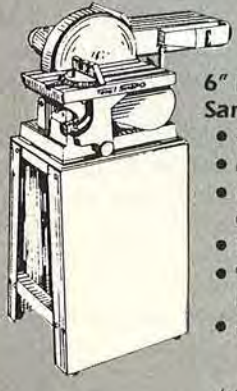

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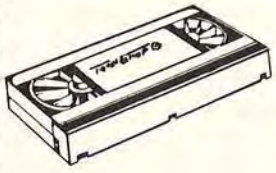

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C1004	1/2	$8
C1005	5/8	$10
C1006	3/4	$10
C1007	1	$12
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C1009	5/16	$6
C1010	3/8	$6
C1011	1/2	$8
C1012	1/2	$15
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1/4" SHANK		
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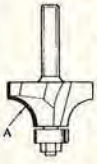
C1157	1/16 R	$11
C1158	1/8 R	$11
C1159	3/16 R	$11
C1160	1/4 R	$12
C1161	5/16 R	$13
C1162	3/8 R	$15
C1163	1/2 R	$16
1/2" SHANK		
PART NO.	A	PRICE
C1171	1/2 R	$16
C1172	3/4 R	$20

ROUNDOVER



1/4" SHANK		
PART NO.	A	PRICE
C1174	1/16 R	$11
C1175	1/8 R	$11
C1176	3/16 R	$11
C1177	1/4 R	$12
C1178	5/16 R	$13
C1179	3/8 R	$15
C1180	1/2 R	$16
1/2" SHANK		
PART NO.	A	PRICE
C1187	1/2 R	$16
C1188	5/8 R	$20
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C1143	3/8 R	$15
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TALKING BACK

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White vinegar loosens joints, too

Here's another way to loosen glue joints as addressed in the October 1989 "Ask *WOOD*" question. I have found that applying white vinegar around the joints and working them back and forth will loosen glue joints. Vinegar also softens many glues, which makes cleanup easier.

—Charles Ballance, Flint, Mich.

Texan offers more ideas on staining cherry

In your October 1989 issue, a reader asked how to get the deep burgundy color in cherry. Your response that it takes patience was not complete. True, cherry eventually darkens with age; however to achieve the furniture-store color, you need to do more. Stains will work, but here's another solution.

Wood, like all things natural, will react with chemicals. Knowledge of some of the chemicals present in cherry or mahogany can aid in coloring wood. Many red-colored woods contain tannic acid, which reacts with sodium hydroxide (commonly known as lye), and darkens to a deep red/burgundy color. A solution of 1 to 2 ounces per gallon of water should give you the desired color.

I've used sodium hydroxide on both cherry and mahogany with excellent results. I suggest you start with a scrap of wood sanded to the same smoothness as your finished product. First, brush on a diluted lye solution. After a short period, wipe off the excess liquid, and then neutralize the lye effect with fresh water. If the color is too light, strengthen your solution. Dilute your solution if the color is too dark.

Please note that lye is poisonous and should be properly stored away from children.

—Michael Barth, Lewisville, Texas

Continued on page 10

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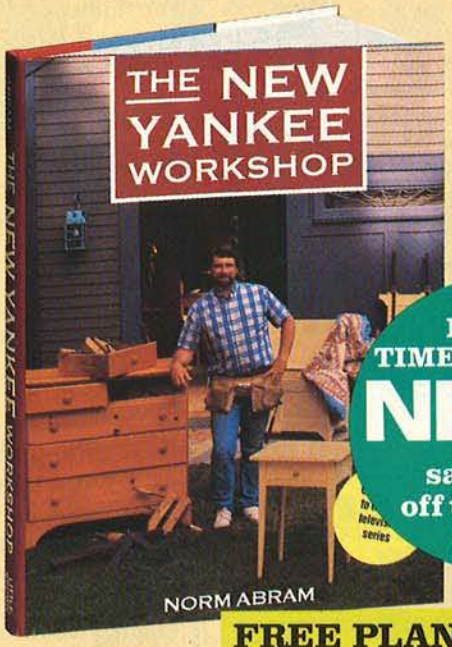

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TALKING BACK

Continued from page 8

Here's an alternative to Plantation stains

In the October 1989 "Products That Perform" column, you reported on Plantation Woodstains. I wrote the address mentioned for the name of a local retailer, but my letter was returned. Can you help me find a dealer near my home?

—Mary Albertson, Harpers Ferry, W.Va.

Mary, after contacting the Albertville, Alabama, Chamber of Commerce, we learned that Plantation Woodstains abruptly stopped production and pulled up stakes after publication of the October issue. We can offer two alternatives. Deft now has several attractive pastels in their "Southwest Collection" of wood stains. Or, for a rainbow of colors, try dissolving Pentel Oil Pastels in paint thinner. A box of 25 colors sells for about $3 at most art stores.

Reader applauds 4-H involvement

As a 4-H family involved in wood-science projects, we'd like to thank you for sponsoring the Wood Science Awards program in 1990.

For the past six years, our family has taught woodworking skills, from the basics of using a tape measure to operating power tools. We teach an average of 30 4-H'ers per year, and have to turn down prospective students because we can't teach more than three days a week.

We have both boy and girl students. They've made simple cutting boards as well as difficult projects such as gun cabinets and desks. The look of satisfaction on their faces upon completing their projects is worth all the time and effort spent teaching them.

Thank you for asking your readers to volunteer as teachers. Many kids out there want to learn woodworking. I hope that many woodworkers will take the time to share their talents with a child. If you can positively touch one child and help him or her to learn and to grow, then the world will be a little better for the time spent.

The kids have built many of the designs from *WOOD* magazine for their 4-H projects. Thanks again for all the good you are doing.

—Gary and Marilyn Malcalm, Branch County 4-H, Coldwater, Mich.

Thanks, Gary and Marilyn. We've received similar letters from county volunteer leaders across the country. We encourage readers to get out there and pass on their woodworking talent and enthusiasm to the next generation. And, don't forget to stroll by the 4-H woodworking displays at county and state fairs. You'll find lots of high-quality woodworking—and probably some project ideas, too. And since we announced our participation, Deft and the Society of Wood Science and Technology have become sponsors.

Continued on page 12

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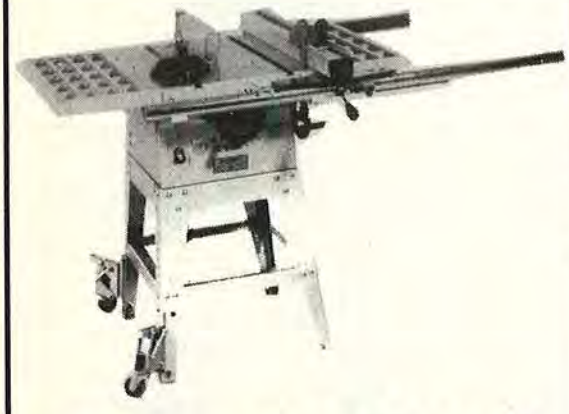

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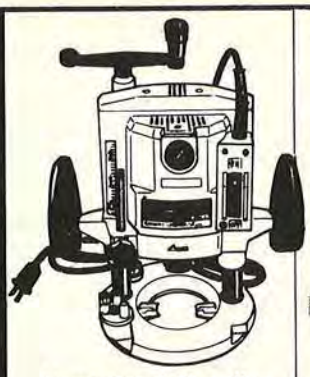

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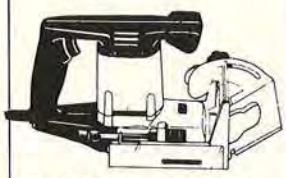
#TR12 3HP Plunge Router with $60 Worth of Accessories	$199
#M12V 3¼HP V.S. Plunge	289
#C8FB 8¼" Compound Slide Saw with Carbide Blade	499



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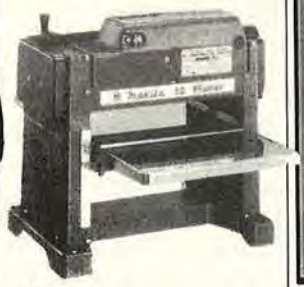
Makita



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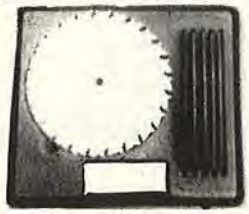

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3/16 to 3/4" wide
Many variations of teeth

TALKING BACK

Continued from page 10

Oh, my ohms

In reference to the December 1989 "Talking Back" item on router speed reducers, your final conclusion that AC motors overheat when the input voltage is reduced more than 10 percent is correct. However, you incorrectly reference Ohm's law: "According to Ohm's law, if resistance in a tool remains constant (which it does, of course), then there must be an increase in amperage when voltage drops." This is incorrect. Ohm's law shows that the voltage, current, resistance, and power relationship as follows:

V = voltage applied
I = current or amperage
R = resistance of the motor (actually, the resistance is impedance made up of resistance and motor inductance)
P = power consumed by the motor
$V = I \times R$

If R is constant, then it can be seen that the current (I) must reduce in direct proportion to the reduced voltatge (V). The circuit power $P = V \times I$ or I^2R.

This is what makes the motor overheat: As the voltage drops, the current drops. This causes a loss of motor speed and motor torque. Lower operating speeds, therefore, severely diminish the motor's self-cooling ability.

The loss of motor torque under load also makes the motor approach a "stall" condition, which also contributes to overheating.

Your answer was correct for the wrong reason.

—John H. Diggs, Pittsfield, Mass.

Too bad we didn't run our response by you before putting the issue on press, John. Your letter was the first of about a dozen or so that found fault with our source's application

of Ohm's law. Another reader, Paul Bokros of San Diego, points out that "the problems encountered by electronic motors subjected to a lower-than-required voltage involves EMF (electromagnetic force) and cannot be explained by Ohm's law alone. The explanation is best left for an electrical engineering/technician book. Let's save the valuable space in WOOD *magazine for woodworking advice, which you give so well."*

Continued on page 14

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2HP $284 3HP $378

3 intake holes (4"), 2HP motor, 3600 RPM, 1250 CFM capacity, 2 bags, 78" height.

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2HP motor, 1725 RPM, 6" x 9" brush head, 4" x 9" air drum, optional heavy duty stand.

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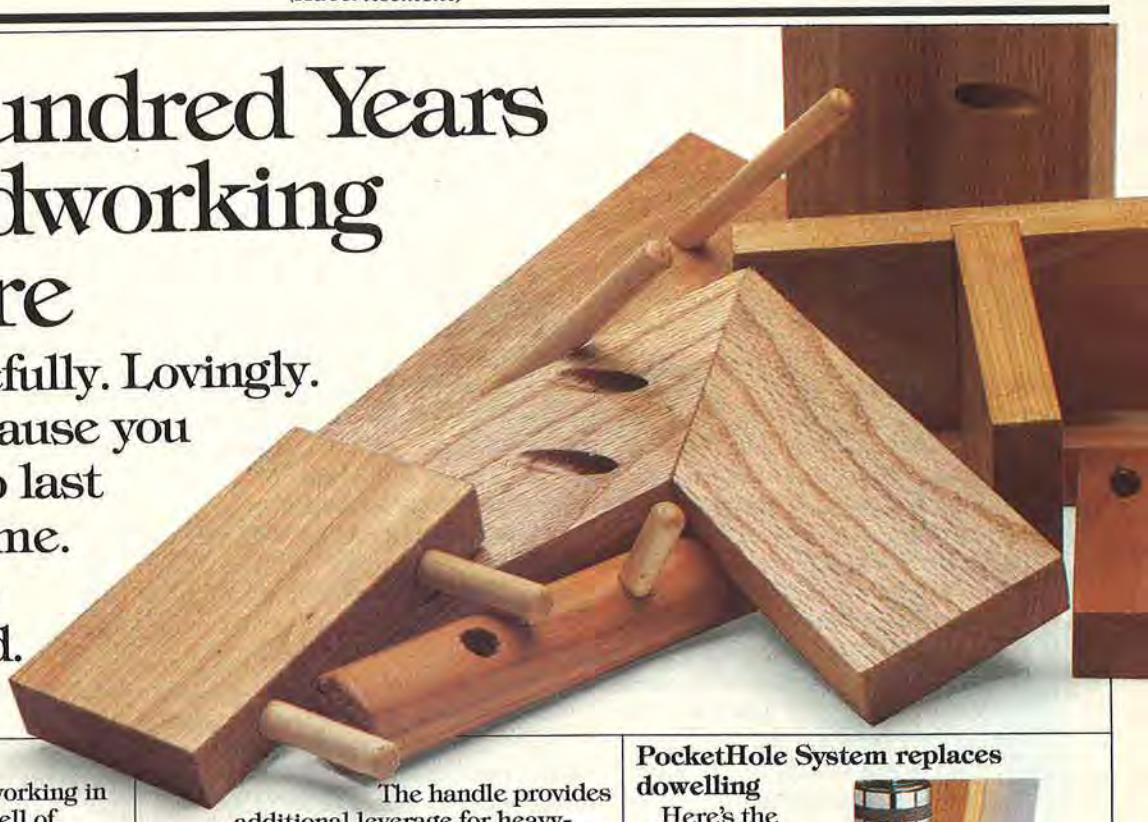

It's a simple pleasure, working in the shop. The fresh smell of wood, the hum of your power tools. Raw lumber becomes an heirloom chest or a delightful toy. Light catches in the grain and shines on the smooth finished surfaces.

And what's better than a well-built tool, the way it responds in your hand as you shape the wood to fit your ideas? Portalign understands.

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You've been punching holes with a drill for years. It's no big deal most of the time. But when it's got to be just *so*?

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The handle provides additional leverage for heavy-duty work and drilling freehand. This is drill press accuracy in a portable unit. Indeed, once you've used our drill guide, you may never use a drill press again.

The Portalign Drill Guide is $24.95.

Saw Guide makes any cut a snap

Any woodworker worth his sawdust can cut a straight line. Other cuts aren't so easy. Used to be you'd need a radial arm saw. The Portalign Saw Guide changes that in a flash.

Now you'll make precision cuts every time. Perfect 90-degree cuts, angles (45 degrees, left or right), bevels, compound miters, dados. Repeat cuts exactly to match pieces. Save time and money with this completely portable saw guide.

It mounts/unmounts easily; sturdy steel construction and spring-loaded

ball-bearing action deliver solid, reliable performance. Cutting reach is 16 inches at 90 degrees; the ball-bearing action reduces binding and kickback.

The Portalign Saw Guide extends the life of your saw and blade! It's just $29.95.

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Drill press not included.

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The PocketHole System is $49.95.

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TALKING BACK

Continued from page 12

Here's how Delta views "reverse engineering"

While the tablesaw article in your December 1989 issue was informative and did a good job of tabulating the tablesaw specifications, further insight into woodworking tools, especially those made in Taiwan, may be helpful.

It is a relatively easy and common practice by many importers to buy a successful U.S.-made product, and then "reverse engineer" it in Taiwan. However, in this situation, the copier does not have access to the product's engineering drawings and data associated with the product. This prevents the copier from knowing how flat the table must be, how precise the arbor is, how the various parts are meant to interact with one another, and what the best machining methods are for key parts. This is not to say that a Taiwanese saw is always a poorer product, but that a copy of another's original design will most often have little chance of being as good.

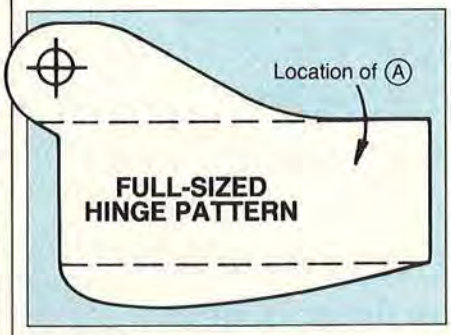
We feel that it also is important to point out that while the section of your article on "Contractor's Style" saws correctly states that the other saws in this category are basically copies of Delta's 34-440, it fails to mention in the "Cabinetmaker's Style" section that the Jet, Grizzly, and Lobo are all Taiwan copies of Delta's Unisaw.

Delta has engineered and manufactured tablesaws for over 50 years. This includes heavy-production saws in Brazil, Unisaws and contractor's saws in Tupelo, Mississippi, and homeshop saws in Taiwan. Our Brazil and Taiwan inspectors and engineers use the same rigid quality-control standards that apply to our U.S. facility.

—Louis C. Brickner, vice president of engineering and product development

Easel folds better with a skinny leg

While building a bunch of the tabletop easels featured in the December 1989 issue, we discovered that a Bill of Materials dimension



for the rear leg (B) doesn't match the full-sized drawing on page 88. The rear leg should be ⅝" thick, as correctly shown in the drawing. For an easier fitting of the rear leg, cut the hinge (D) to the shape shown *above*.

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7-pc Set
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On Sale ... **$119.95**
(Includes $52 ***FREE*** Accessories)

Cut intricate wood patterns with this versatile machine.

FEATURES:

- **Parallel rocker arm cutting system** - eliminates blade breakage & sanding.
- **E-Z set blade change system** - permenant, easy to use upper arm blade holders.
- **FREE Accessories** - 1 dz blades, extra blade holders, E-Z set system, Plastic lettering guide set .. $ 52 Value

SPECIFICATIONS:

• Cast iron construction • 15" throat • Motor: 1/8 HP, TEFC, 1650 RPM, 110V, UL Listed • 3/4" stroke • 2" depth of cut • Table tilts to 45° • 43 Lbs.

Item #SAW .....$119.95 (UPS $10)

Scroll Saw Accessories

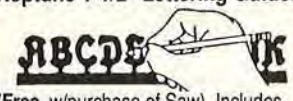
Dust Blower

Installs between lower arm and base - keeps your pattern line visible at all times. Installation instructions included.
#BKT .... $15.00/Kit (•)

Saw Stand *(On Sale)*

Suitable for Super 15" Scroll Saw or #S46 Sander. 37" High - perfect height & a great convenience.
#STD ... (Reg $39)
On Sale **.. $26** (UPS $4.00)

Neptune 1-1/2" Lettering Guides



(**Free** w/purchase of Saw). Includes upper & lower case alphabet + numbers + free patterns. **#LN1 ..... $12**/set (•)

"E-Z Set" Blade Holder System

(**Free** w/purchase of Saw). Clamps any blade (to "000" size) easily into these pivoting blade holders mounted permanently on saw arms. **Simplifies re-attaching blades** when making internal cuts. Simple installation.
Item **#RET** .....**$15**/kit (•)

Magnifier Lamp

Great for magnifying scroll work or closeup work of any kind.

•175% mag
•39" flex arm
• UL approved
• 60 Watts Incandescent
Item **#SML** ..... **$29.95** (UPS $3)

Scroll Saw Blades (5")

#BPK - 4dz asst. (2dz Pin, 2dz #9)...**$14**(•)
#BPS - 2dz Spiral blades (size #2)...**$10**(•)

Super 125 Planer

On Sale **$349.95**

This machine will pay for itself time and again by planing your own wood. Finishes wood like machines many times its price.

FEATURES:

• **Portable** at 65 lbs • **Power feed** •12 1/2" wide High Speed Steel Knives Shipped assembled and ready to run.

SPECIFICATIONS:

Motor: 16Amp, 115V, 8000RPM, 2HP• 26.2 fpm auto feed rate • 16,000 Cuts/min • Thickness of stock: 3/16" - 6" • 3/16" Max depth of cut • 2 HSS knives

Item #PLA ..... $349.95 (UPS $15)

Planer Accessories

Free *plans for roller stand with purchase of rollers*

Extra Set of 2 Knives

High Speed steel, 12-1/2" long.
Item #PKN .....$25.00/set (•)

Dust Chute

For vacuum takeoff of wood chips.
#PDS ..(reg $24), **On Sale....$15** (UPS $3)

Planer Stand (Heavy duty)

Drilled for Super 125 Planer. 27-1/4"High.
#PST ...(Reg $44), **On Sale...$39/ea** (UPS $6)

Roller Stand

HTC brand support stand w/heavy duty ball bearing roller. Height adjusts from 25" - 44".
#PRS ...(reg $40), **On Sale** ...**$35** (UPS $4)

Ball Bearing Rollers

(Minimum purchase 2 rollers). Build a roller stand, infeed/outfeed table etc. with these 13" X 2" Heavy Duty rollers. Purchase includes **FREE** plans for roller stand shown above.
Item **#BBR** ..... $6.50/ea ($3 UPS /order)

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We unconditionally guarantee your satisfaction with our fine machines. All of our machines carry a Thirty day Money Back Guarantee and One year Warranty for Parts and Labor

Wood Lathe XL- 40

Reg $299.95 ... **On Sale $249.95** (UPS $20)
Includes ***FREE*** 8 piece Wood Chisel Set ... **$34 Value**

Our new XL-40 Wood Lathe surpasses every lathe in its price range with quality & features you would expect from machines many times its price.

FEATURES:

Heavy Duty cast iron construction provides smooth turning action • **40" Centers • 16" Swing** for turning larger bowls • Smooth toolrest movement on 1" solid steel rails • **"Live" center** on tailstock • **Motor mounted for easy positioning** and belt changes • **Sturdy 52" steel base** mounts on table top or optional stand.

PURCHASE INCLUDES:

• Lathe with Motor & Base • Toolrest • 6" Faceplate • 8 pc wood turning chisel set

SPECIFICATIONS:

• MOTOR: 1720 RPM, 1/2HP, 8AMP, 110V • 3 SPEEDS: 660, 1500, 2850 RPM • Overall length - 60" • Weight - 100lbs

Item **# L40 .....*On Sale*** **$249.95** (UPS $20)

Lathe Accessories

XL-40 Lathe Stand

Heavy duty. Wt. 25Lbs
Size: 28"H X 56"L X 21" W
Item **#LST ..... $59/ea** (UPS $6)

4 Jaw Wood Chuck

This 6" chuck has 4 independent jaws for holding odd or square shaped work. Jaws can be reversed for inside chucking.
#L4J ..**$49** (•)

8 Piece Wood Chisel Set

(***FREE*** **w/purchase of XL-40 Lathe).** Forged from high carbon steel. Includes 3 gouges, 2 skews, 1 round nose. 1 parting tool and 1 spearpoint.
#LCS ...$34 /set (•)

Two way 4"x6" Sander

On Sale ... **$109.95** (UPS $8)
(Includes **$10 FREE** Belts & Discs)

Item #S46

Here's a machine that adds true versatility to your shop.

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Uses **universally available** 6" discs, 4" x 36" belts • Includes Assortment Of 3 Belts, 4 Discs Of Various Grits • **Built in Dust Collection** outlet • Aluminum table: tilts to allow bevel sanding to 45°, includes mitre gauge, removable for use with both disc and belt • Belt tilts/locks to any position from horizontal to vertical • **Quick release lever** for changing belts • **Single action tracking** adjustment • Motor 1/3HP, 1720RPM, 115V • Weight - 40Lbs

DC-1 Dust Collector

(Includes $15 ***FREE*** Hose & Fittings)
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(UPS $20)

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1HP • 110/220V (pre-wired 110V) • 610 CFM air flow • 2ea 20 gal bags • 4" inlet • Castors on base • WT - 75 lbs

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Dust collection hose • 4" to 3" rigid adaptor • 4" to 2" flex adaptor • Plans for 2 stage setup • Sources for accessories

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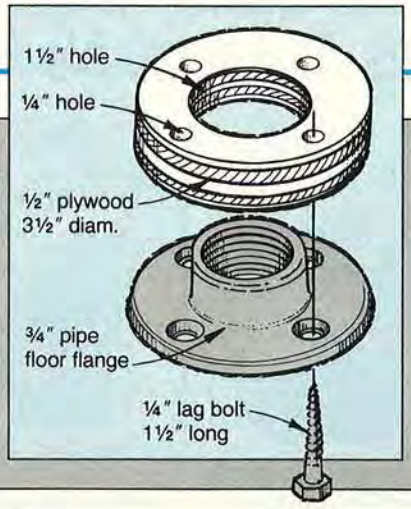
Print this article

Improved bench hold-down

Louis Hathaway of Yankeetown, Fla., wrote to us after he had problems putting together the bench hold-down that appeared in the December 1989 issue. Because of tapered threads, he had a problem finding a floor (pipe) flange that made the hold-down easy to use. So, he made a ½" plywood donut as shown at *right* to solve the problem. Thanks, Louis!



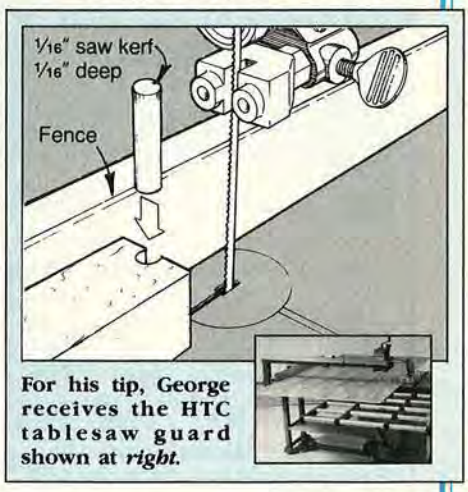
A simple jig for grooving dowels

Carefully fitted dowels will trap both air and excess glue when inserted. Unless you provide an escape route, that air or adhesive may prevent you from bringing together the joined pieces. If you force them together, the built-up hydraulic pressure may cause the dowel to pop out of its hole when you're not looking.

TOP SHOP TIP

TIP: For dowels 1½ to 2" long, build a jig out of scrap wood as thick as the dowel length. Near one end, drill a hole the same diameter as the dowel and then crosscut the scrap so two-thirds of the hole remains as shown *below.* Insert the dowel in the jig and cut a 1/16" saw kerf 1/16" deep with a bandsaw. One groove will allow air and glue to escape. Now, you can plug away with confidence!

—George Mitro, Jr., El Paso, Texas



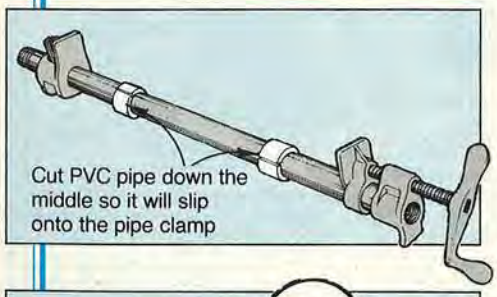
For his tip, George receives the HTC tablesaw guard shown at *right*.

Shims that don't fall off your pipe clamps

When banding plywood or edge-joining stock, it helps to use thin scraps of wood as shims or spacers to raise the workpiece above the clamp's pipe. Unfortunately, these scraps fall out and are a pain to manage while you're setting up your clamps.

TIP: For ¾" pipe clamps, cut 1" lengths of 1" PVC pipe. Make one longitudinal cut in each one so it slides easily along the pipe and slips on as shown in the drawing *below.* For ½" pipe clamps, cut the shims from ¾" PVC pipe. These split rings elevate the work about ⅛" from the pipe, putting it closer to the center of the jaws.

—Terry L. Davis, Ft. Pierce, Fla.



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Here's an idea that's easy to warm up to

Removing old sandpaper attached to disc sanders with pressure sensitive glue can become a headache, especially when the adhesive won't release. Eventually, the paper tears and pulls apart and leaves a mess on the metal mounting plate. There has to be an easier way!

TIP: Use heat to soften the adhesive. The source can be a handheld hair drier as shown, a heat gun or even a heat lamp. Apply heat directly to the sanding disk in a waving motion that covers the entire disc. Test by lifting the disc, and use more heat if necessary.

—Steve E. Miller, Dallas, Ore.

Continued on page 18

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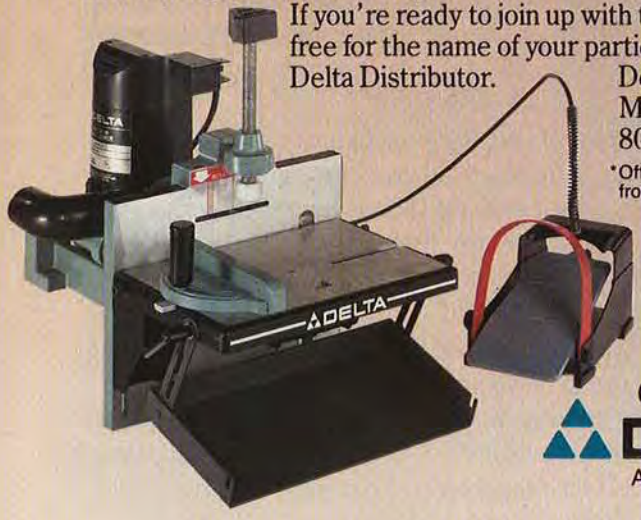

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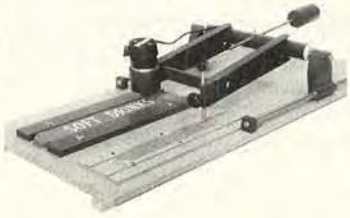

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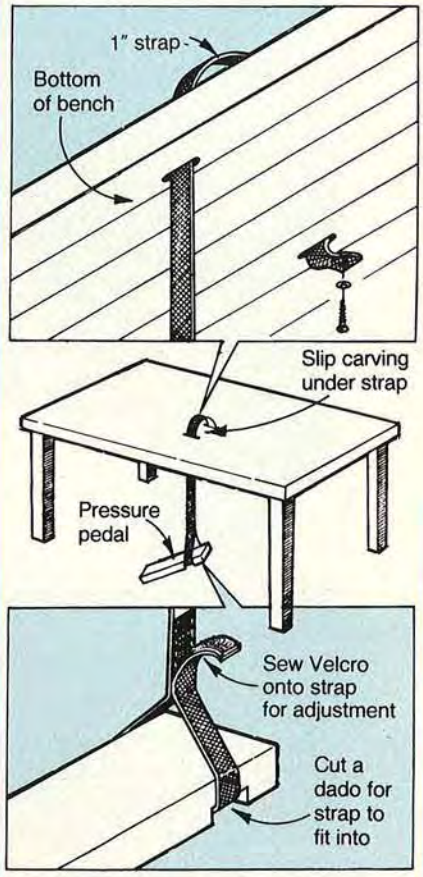
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 16

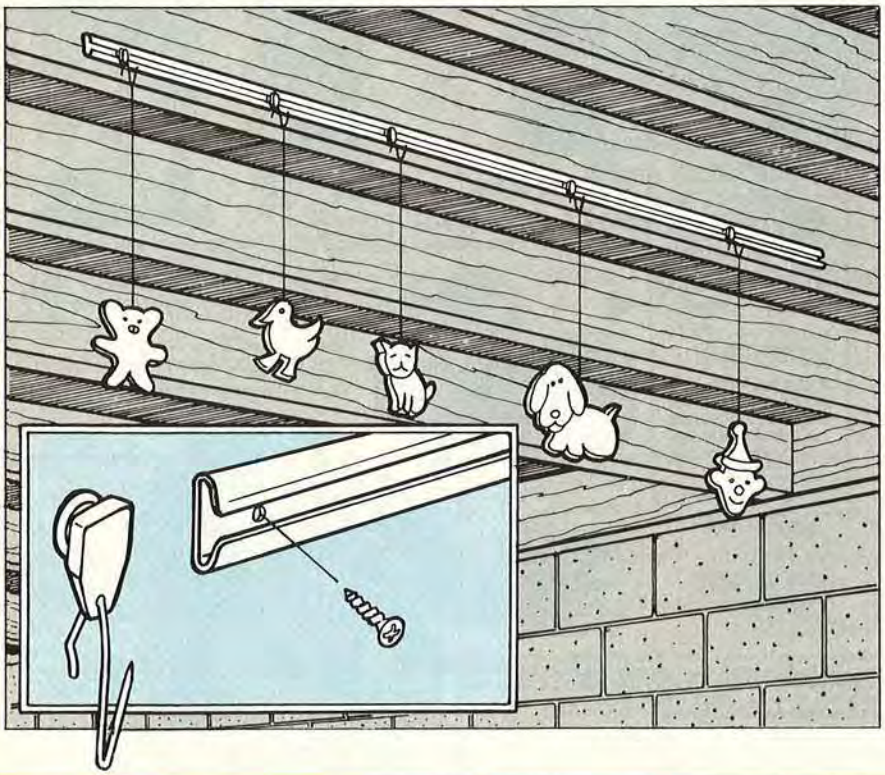
Great holding device for odd situations

Toolmakers have been truly ingenious in designing a wide variety of clamps and hold-downs for woodworkers. Even so, puzzling situations arise when nothing fits an odd-shaped workpiece.


1" strap
Bottom of bench
Slip carving under strap
Pressure pedal
Sew Velcro onto strap for adjustment
Cut a dado for strap to fit into

TIP: A strap clamp that uses a pressure pedal to hold workpieces on a bench often solves these off-the-wall quandaries. Materials needed include 4′ of 1″-wide canvas strap, a panhead screw and washer to attach one end of the strap to the bottom of the workbench, a 1′ length of 2×4 to serve as a pressure pedal, and pieces of Velcro fastener to adjust the length of the strap. Cut slots in the bench top and assemble the pieces as shown. This arrangement will hold carvings of most any shape and allows you to quickly loosen and reposition the workpiece.

—Jerry Rakoezy, Rawlins, Wyo.



A curtain call for finishing small parts

Finding a suitable place to keep small parts while they dry after staining or finishing can leave you in a real quandary.

TIP: Screw a length of curtain rod to a ceiling joist for a great out-of-the-way place to hang up such parts. Slip drapery carriers into the track, add curtain hooks, and you have a drying rack that's ready to use. Screw small cup hooks into the backs of the workpieces and hang them on the rack with lengths of wire or thread and apply finish. These will hold a surprising amount of weight. If you don't want to make screw holes in the backs of the pieces, use straight pins with hooks bent into them near the heads. Or, attach hooks to the pieces with hotmelt adhesive.

—Robert McGloin, Elyria, Ohio

Continued on page 21

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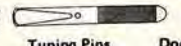

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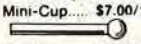

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TIPS FROM YOUR SHOP (AND OURS)

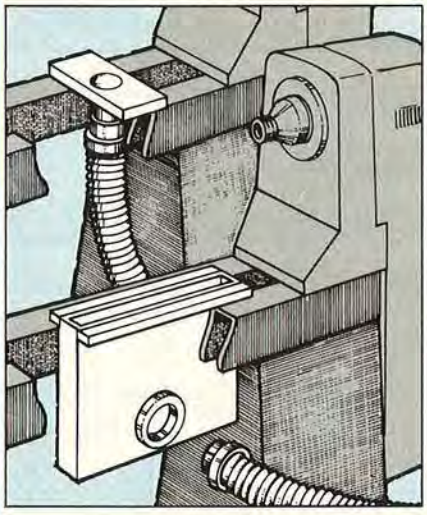
Continued from page 19

Catch that storm of lathe chips

Turning wood on a lathe often generates a cloud of dust and fine chips that can nearly overcome you after a few minutes.

TIP: In a suitable length of 1×4" stock, cut a hole just large enough to receive the nozzle of your dust collector or shop vacuum hose. Place it underneath the piece being turned. If the size of your workpiece allows, make a box with the hose fitted near the bottom.

—Mark T. Jones, Durham, N. C.

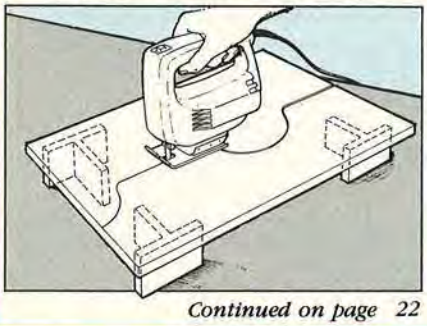


Blocks suited to a "T"

It's tricky jigsaw work to cut along curvy lines on a large panel. The problem: How to properly support the workpiece and provide blade clearance.

TIP: Make T-blocks from 2×4" pieces as illustrated. Four or more of these provide plenty of clearance for any jigsaw blade and support the panel.

—Ralph R. Parschen, Pine Bluff, Ark.



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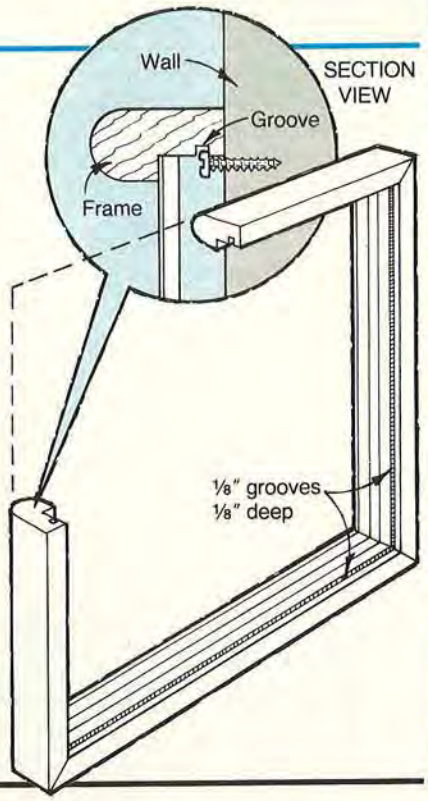
TIPS FROM YOUR SHOP (AND OURS)

Continued from page 21

Build self-hanging picture frames

It's great fun to cut your own picture-frame stock and put it together. Unfortunately, conventional hanging devices such as screweyes with wires or serrated metal hangers don't allow the frame to hang flush against the wall.

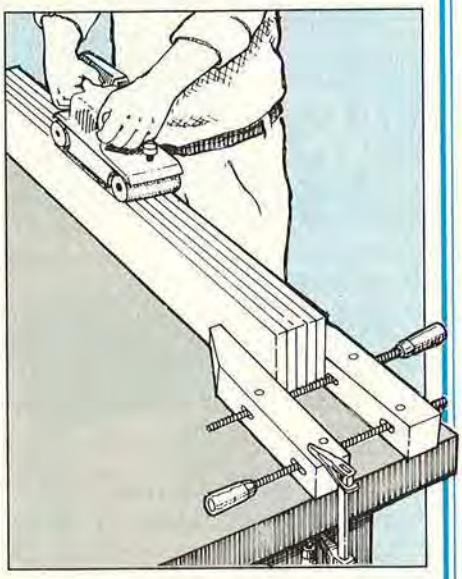


TIP: As you cut your frame stock, leave an extra quarter-inch of material on the backside for a ⅛" kerf ⅛" deep and ¼" inside the edge as shown. Hang the picture on two pan-head screws spaced apart on a level line about half the width of the frame. The top of the screw heads should protrude ⅜" from the wall. The picture remains plumb and flush against the wall, but you can shift it horizontally.

—Keith Hyde, Des Moines

Clamps help you sand edges

Hand-holding a belt sander to finish the edge of one or more pieces of stock can turn into a balancing act. Here's a dependable way to do it and make the boards an even width at the same time.



TIP: Hold the pieces together with hand-screw clamps as shown at *right* and secure one end of the assembly to the benchtop with a third clamp. This arrangement gives you a wide, stable surface to sand and, ensures uniform sanding of the material. If you have only one board to sand, clamp auxiliary scrap boards of equal or longer size to its sides to support the sander.

—Charlotte Arthur, Colbert, Okla.

More super tips from our woodworking pros

You'll find more tips throughout this issue of *WOOD* magazine:

- You can cut shapes in glass using a sandblaster. See page 37.
- It only takes a few seconds to cut a flush box and lid with the tablesaw procedure on page 54.
- The zero-clearance auxiliary scrollsaw tabletop on page 58 helps you make splinter-free cuts.
- Even if you don't need our nifty tablesaw base on page 60, you might be interested in the push-stick pattern and handy blade holder shown in that article.
- To drill even-angled multiple holes, see our advice and drilling jig on page 70.

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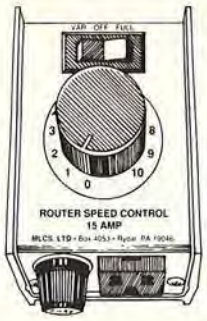

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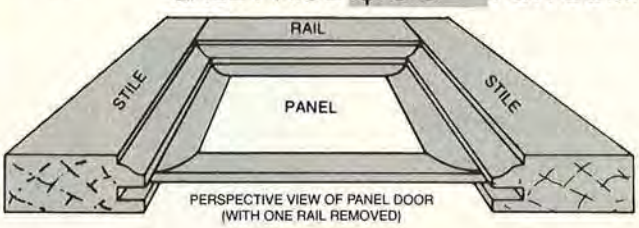

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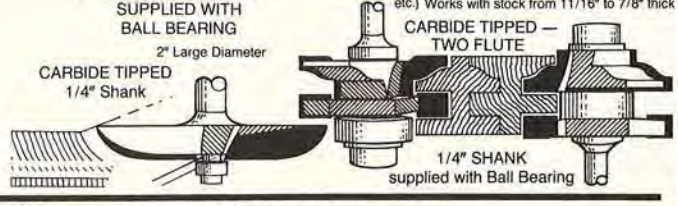

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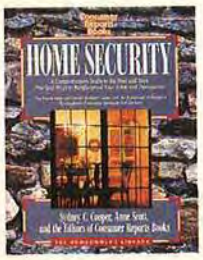

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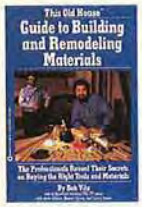

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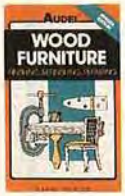

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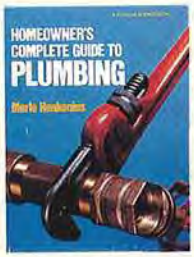

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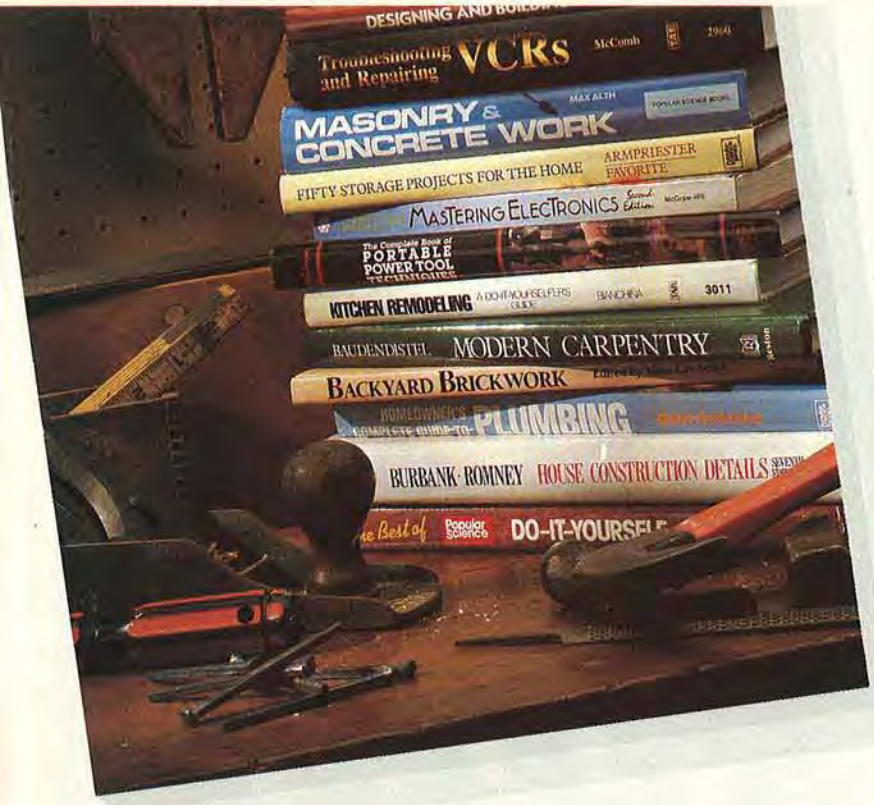
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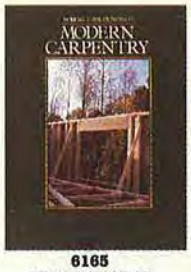

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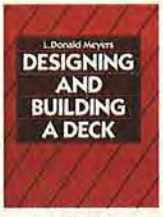

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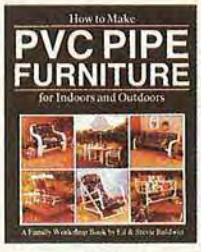

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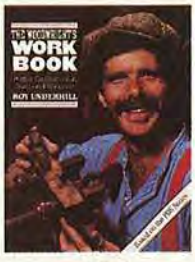

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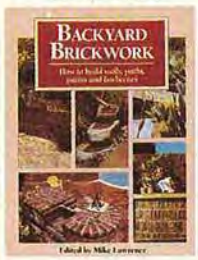

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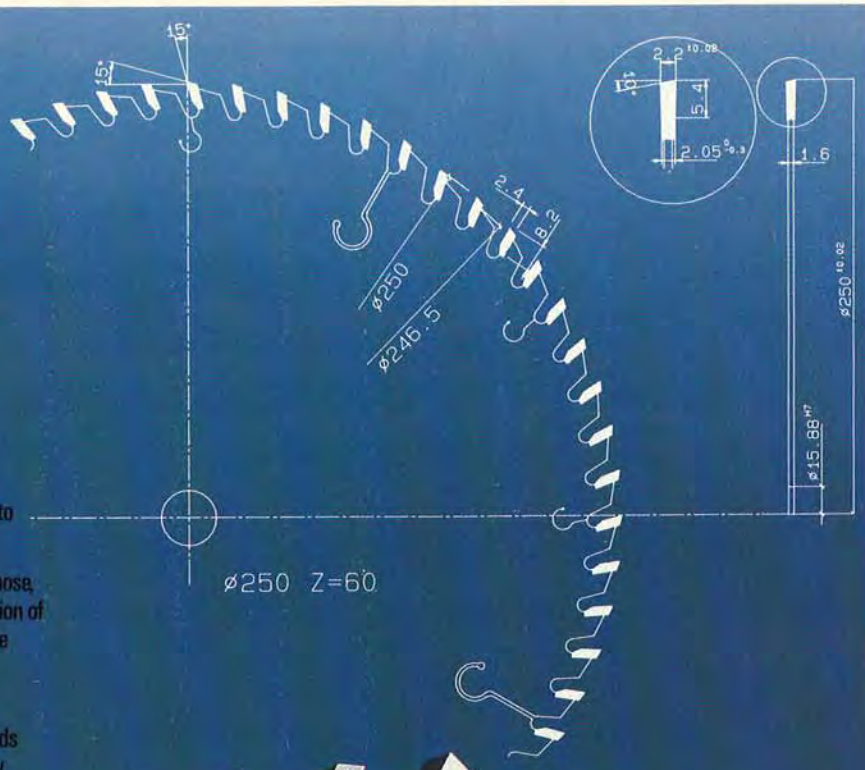

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Thin kerf blade compared to standard kerf blade

Freud thin kerf blades Rip (left), Crosscut (right)

Freud Perfects the Thin Kerf Blade.

Using advanced technology, Freud's international team of European and North American engineers have perfected the thin kerf saw blade. They have eliminated misaligned teeth, poor blade body tensioning, carbide chipping and a variety of other problems common with some thin kerf blades.

The kerf on the Freud 10-inch crosscut blade, 28% thinner than the standard .126 inch kerf blade, reduces material loss when working with rare or expensive wood.

Freud's thin kerf blade also requires less energy to feed the material into the saw blade, eases the strain on your power tool and makes your work easier and safer.

Turn your under-powered saw into a real board cutting champion with Freud's thin kerf blade. Each thin tooth takes out less wood than the standard carbide blade, thus requiring less horsepower to produce equally good results. Also, the radial arm saw's aggressive self-feeding characteristics are virtually eliminated.

For the best value in advanced thin kerf blade technology, demand Freud.

Stock Number	Thin Kerf Rip	Kerf
LU87M008	8" x 22 x 5/8"	.086 inch
LU87M009	9" x 22 x 5/8"	.094 inch
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Stock Number	**Thin Kerf Crosscut**	**Kerf**
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NORTHERN RED OAK

From men-of-war to kitchen cabinets, always number one

To England's ancient druids, the oak symbolized strength. Warlike Norsemen even cherished pieces of the wood as charms to protect them from evil. But to the Greeks, Romans, and later seafaring nations, oak meant sturdy men-of-war and reliable merchant ships. In fact, England and France reserved whole forests for use in building their fleets. That's why red oak from North America saw immediate popularity when it was introduced to those countries in the early 18th century. Within a few years, northern red oak substituted for native English and European oak species and was crafted into furniture and paneling.

Even after centuries of popularity, northern red oak still outsells all other hardwoods. And luckily, it's plentiful, comprising about one fifth of the standing timber species grouped as red oak.

Wood identification

The broad, spreading crown of the northern red oak (*Quercus rubra*) shades the landscape in a sweeping range that covers nearly half the U.S. and much of southeastern Canada, as shown on the map, *top right*. More commonly called red oak, but also known as eastern red oak, gray oak, and Canadian red oak, the tree can grow to 150′ heights with trunks 6′ in diameter in fertile upland forest soil. Open-grown trees more often approach only 70′, with trunks that separate into several large branches.

Northern red oak has distinctive leaves up to 9″ long, with a pointed bristle on each lobe tip. In the spring, flowing catkins of pollen-bearing flowers emerge amid the greenery. Acorns about 1″ long develop every two years.

Rare is the board of northern red oak that carries a trace of its light-colored sapwood. Instead, the vast majority of northern red oak treats woodworkers to nicely figured heartwood with a pinkish tint.

You'll find that northern red oak has coarse-textured, straight, open grain. This hard, stiff, strong wood weighs 44 pounds per cubic foot dry—just a little more than walnut.

Natural range

Uses in woodworking

Ever since the early 1970s, northern red oak has been highly favored for kitchen cabinets, and still leads in appeal for all kinds of furniture as well as millwork and flooring. Turners and carvers, too, find the wood a choice stock for decorative projects. (To learn about this wood's working properties, turn the page.)

Availability

Hardwood dealers and home centers offer northern red oak as lumber, veneer, plywood, turning squares, and dowels. But, all northern red oak won't be the same. Trees from the North—from the Appalachians on into Canada—grow slower and therefore have a more uniform color and a finer, easier-working texture than those from the South. Other characteristics remain the same, though. And, no matter where the wood hails from, board-foot price hovers around $3.

Continued

PERFORMANCE PROFILE

northern red oak

(Quercus rubra)

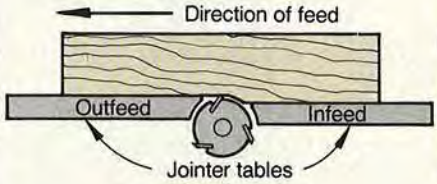
Filled red oak

Unfilled red oak

Machining methods

As most woodworkers will attest, red oak works wonderfully, but it does require power tools. Even then, the wood sometimes takes special handling. *Our observations:*

- Feed red oak on the jointer so that the knives' rotation follows the direction of the grain flow (see sketch, *below*). Failure to do this generally produces chipping.
- Due to red oak's open, straight grain, it offers only moderate resistance to ripping.
- Red oak quickly dulls anything other than a carbide blade.
- Too fast a feed rate on the table or radial-arm saw, or with the router, can cause burning, although burns sand off easily.
- Red oak tends to splinter. So, use shallow router passes on end grain and a backing board clamped to the exit side on cross-grain work.
- Metal, such as a clamp bar, touching glue squeeze-out produces a dark blue stain. Lay wax paper over the glue line.
- Red oak grips screws, but even with pilot holes, lubricating the threads with paraffin eases driving.
- Although red oak sands readily, try garnet paper for hand-sanding and with orbital sanders. For belt sanders, we prefer oxide-type abrasives. Swirls and other sanding marks come off nearly effortlessly.
- For the smoothest possible finish, fill red oak's grain with a paste-type filler. The filled wood (see photo, *top right*) has less dramatic grain contrast, but it requires fewer coats to build the final finish. For a lighter fill, sand surfaces with Danish oil as a lubricant. The sanded-off fiber packs the grain.



Carving comments

Only the most accomplished carvers tackle hard red oak, and then mostly for relief work. You won't get far without a mallet and very sharp gouges. Some tips:

- Change from a shallow bevel (of 15°–20°) to a deeper bevel of 25°–30° when you rough-in the outline of a relief design. Your gouges stay sharp longer. Then, when it's time to do the details and complete the carving, grind to a shallow bevel again for shaving.
- *Our advice:* Avoid slices along straight grain with stop cuts.

Turning tricks

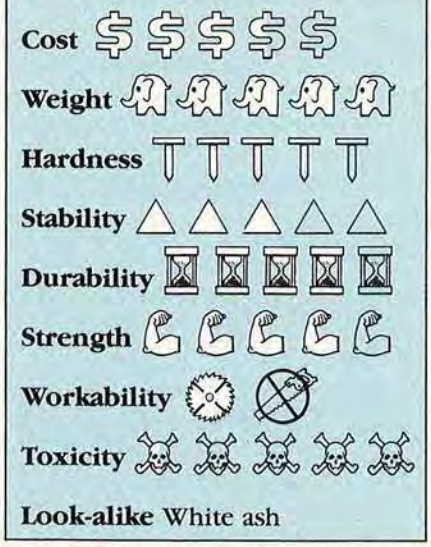
- When turning between centers, combat splinters by entering the wood with a sharp tool, such as a clean-cutting skew, and taking shallow cuts, especially when first rounding the turning square.
- *Our turning tip:* Keep tools sharp to cut rather than abrade. And, don't start at one end and cut all the way to the other. Remove wood a little at a time in each section because the grain may run on a bias and splinter away.

SHOP-TESTED TECHNIQUES THAT ALWAYS WORK

Any exceptions, and special tips pertaining to this issue's featured wood species, appear under headings elsewhere on this page.

- For stability in use, always work wood with a maximum moisture content of 8 percent.
- Feed straight-grained wood into planer knives at a 90° angle. To avoid tearing, feed wood with figured or twisted grain at a slight angle (about 15°), and take shallow cuts of about 1/32".
- For clean cuts, rip with a rip-profile blade with 24–32 teeth. Smooth cross-cutting requires about a 40-tooth blade.
- Avoid drilling with twist drills. They tend to wander and cause breakout. Use a backing board under the workpiece.
- Drill pilot holes for screws.
- Rout with sharp, preferably carbide-tipped, bits and take shallow passes to avoid burning.
- Carving hardwoods generally means shallow gouge bevels—15° to 20°—and shallow cuts.

RED OAK AT A GLANCE

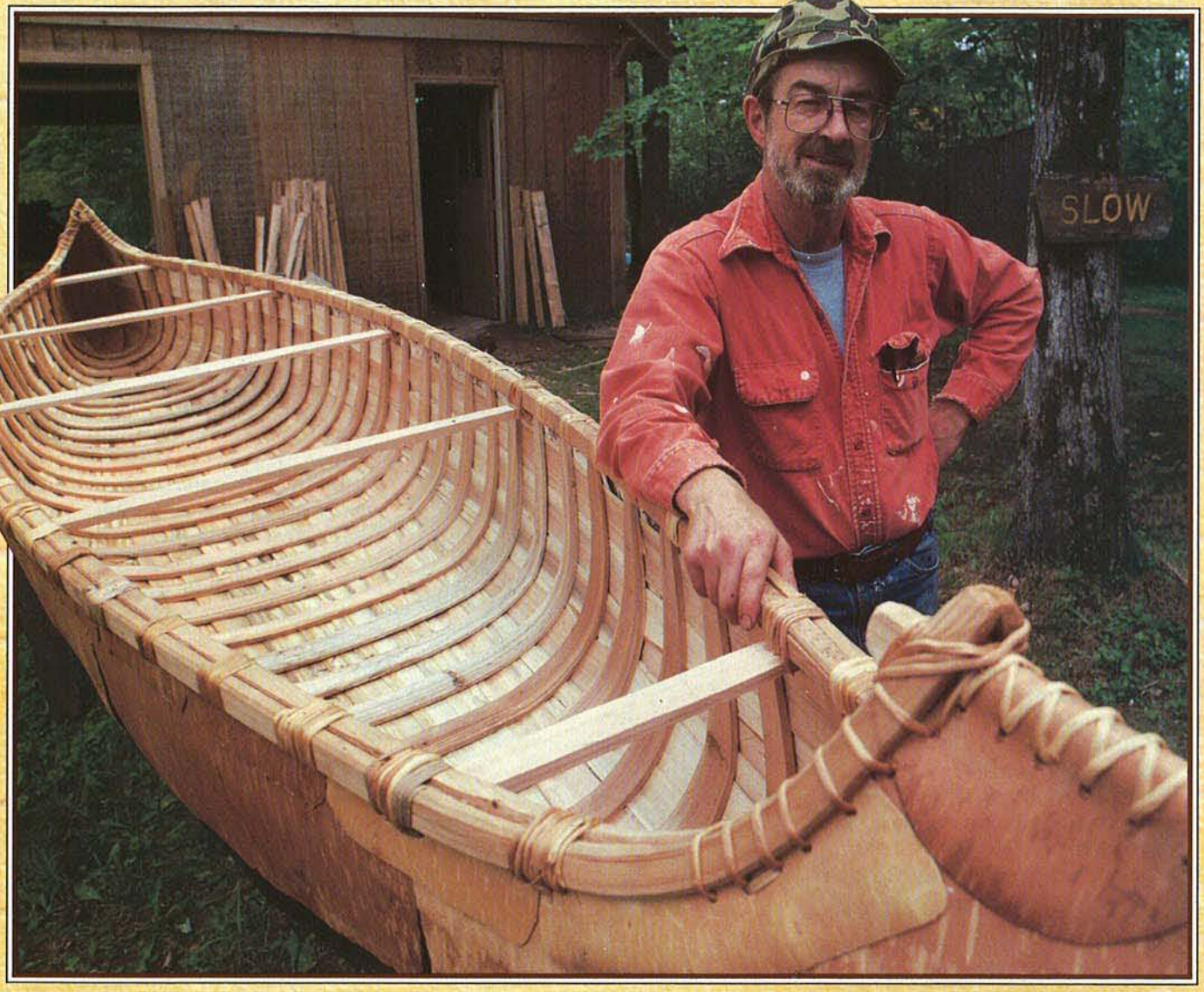


Look-alike White ash

Compiled with woodworkers Jim Boelling, Don Wipperman, carver Ron Mackey, and turner Cleat Christiansen Illustrations: Steve Schindler, Mike Henry

Print this article

Long Live THE BARK CANOE!



"Because it's built of spruce root pulled from the bog, cedar felled in the lowlands, and birch bark stripped deep in the damp forest, the bark canoe thrives in contact with water."

John D. (Jack) Minehart
Canoe builder

Welcome to Max, Minnesota, home to a wild-rice processing company, grocery, hardware, mercantile, post office, and lumberyard—all in one building. Within a crow's flight, there also are a half-dozen resorts, two or three unpretentious eateries, a few hardy logging enterprises, some struggling farms, and longtime summer resident Jack Minehart, master canoe builder, *above.*

From late May through most of August's heat, Jack, 54, plies his craft on Little Sand Lake, building three or four bark canoes per season. Come late summer, he reluctantly hangs his tools, locks the shop, and packs for the return to Cedar Falls, Iowa. There, a classroom of high school students awaits his textbook history instruction. We, however, prefer the hands-on lessons Jack taught us up north.

Continued

THE BARK CANOE

Max, a sunlit break in the shaded heart of northern Minnesota's Chippewa National Forest and the Leech Lake Indian Reservation, seems a logical place to find a canoe builder. After all, the area's Chippewa Indians once claimed such craftsmen. Before the days of white settlement, the native canoe builders provided the craft for their peoples' frequent travel on the land's countless lakes and rivers.

Roads, rails, and motors, however, long ago dashed and sank the bark canoe. As horses and wagons—then trains, automobiles, and outboard motors—replaced paddles, the necessary techniques to build the craft faded in the aged hands of the skilled. Jack Minehart learned the primitive ways, not as passed from red man to white, but as unearthed by a local living legend, William Hafeman. Jack's mentor came north before the Depression to wrest an existence, and learned to build canoes from those who remembered.

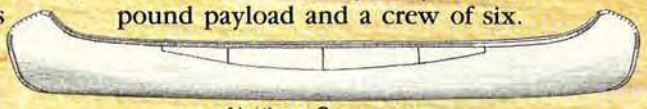
From Hafeman, now in his 90s, Jack learned how to gather materials, prepare them, and assemble a bark canoe to match any of old. His keen interest in history and the outdoors had finally combined to preserve a part of the past.

Algonkin canoe

Aboriginal origins, practical uses

Jack notes that the first French explorers of 17th century in what was to become Canada—and later the English in the northern United States—were impressed by the Indians' light, swift craft. They recorded that the native boats with two paddlers easily outdistanced European longboats with several oarsmen. But, according to the canoe builder, it wasn't until the great fur trade began in the early 18th century that what came to be called the canoe was really appreciated.

It required swift travel for men and trade goods to reach the vast and roadless northern interior, then return with loads of valuable fur before the coming of winter. And the lightweight bark canoe with its sturdy wooden frame was the essence of speed as well as a workhorse. A 26'-long trade canoe, for instance, could easily carry a 2,000-pound payload and a crew of six.



Northern Cree canoe

WOOD® ON THE ROAD

On the workshop floor, I help Jack mount belt-leather-thick birch bark on a frame for lacing into a side section.

As a kid, I drew pictures of canoes with Indians in them. Of course, I always put the white side of the bark on the outside. That it isn't was just one thing I learned from Jack Minehart.

With Jack, I gathered bark—and fought deer flies and mosquitoes. I got my feet wet pulling spruce root, too.

Back at the shop, Jack showed me how to debark the root and split it. I also plied cedar into thin planks. In fact, I helped with almost every aspect of canoe building during my visit to Little Sand Lake. My biggest lesson, though, was learning what marvelous engineers and craftsmen our Native Americans were. Jack salutes them every time he launches a new canoe.

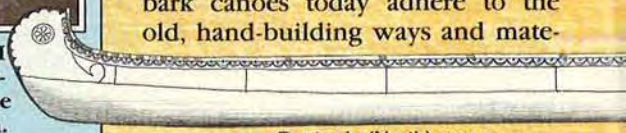
Peter J. Stephano

Features editor

To the fur traders who bought and the tough voyageurs who paddled, the canoe had other advantages. "It fit the environment perfectly," Jack remarks. "It could maneuver the smallest rivers and float in shallow water. Surprisingly rugged, the bark canoe withstood all but the harshest abuse. Best of all, the traders could employ Indians to build them quickly and inexpensively, and even the unskilled could repair a canoe on the trail with materials on hand."

Not all North American Indian tribes built and utilized the canoe, but among those that did, shapes varied according to use and tradition (see sketches here and on the following pages). However, construction and materials varied little, as shown on the next page.

The few craftsmen who build bark canoes today adhere to the old, hand-building ways and materials as much as possible. That's why Jack can ask $125 per foot for his. That's also the reason his buyers—often professionals from fields such as archaeology—wait two years for delivery and pay freight.



Fur trade (North) canoe

From a sea of birch, few trees are chosen

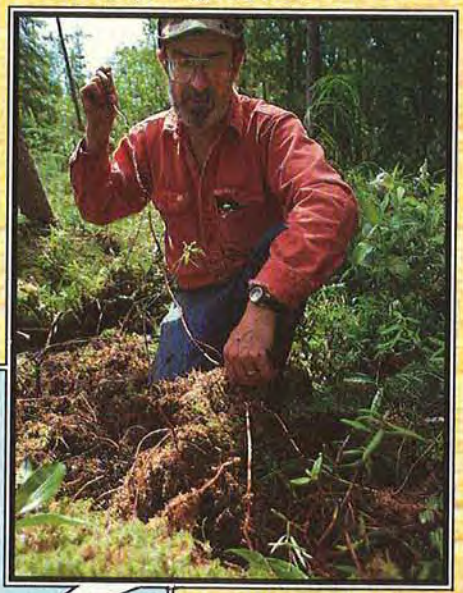
Indians frequently made canoes with the bark of other trees—spruce, elm, chestnut, hickory, basswood, and cottonwood, for example. But these were only substitutes for bark from the paper, or canoe, birch (*Betula papyrifera*). In the days of the fur trade, large birch trees dotted the northern portion of the continent, and native canoe makers often lifted the bark from a single tree to sheathe a craft.

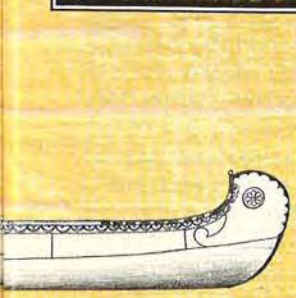
(Note: Stripping the outer bark from a standing birch tree does not kill it. However, the area of the removal eventually fills with blackish scar tissue, never regaining its chalk-white bark.)

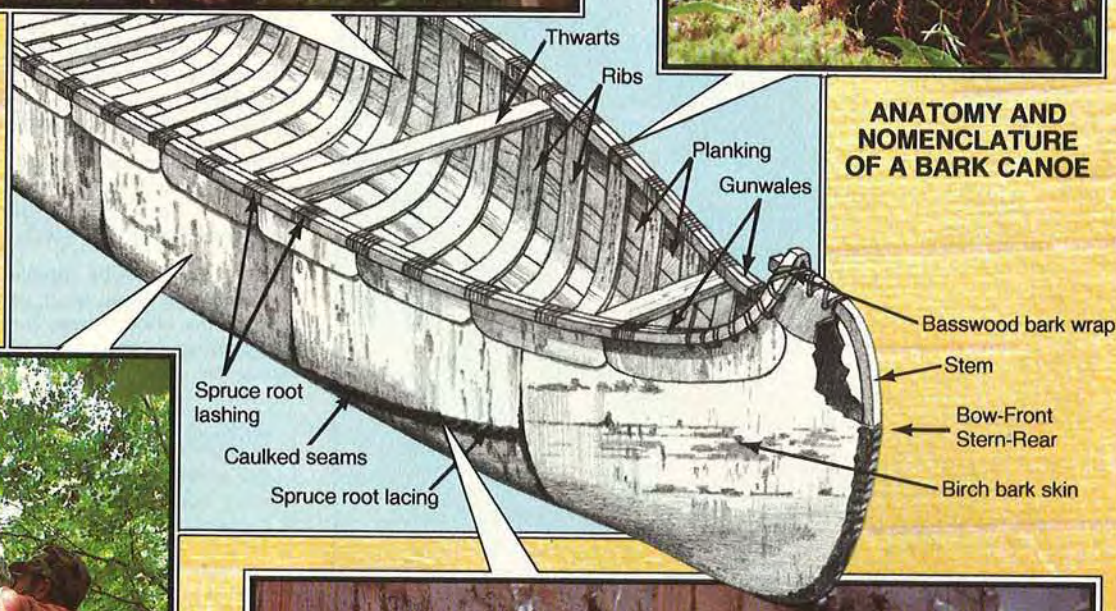
Continued

"If you can't split cedar, then you're not going to build a canoe," Jack says. After hauling the cedar home, he hand-splits and resplits the white cedar billets for the planking until each piece measures ⅛" in thickness.

For one canoe, Jack pulls a total of 300' of black spruce root from under the floating moss of a bog. Each root runs 5'–15' long. Debarked and split, the root makes about 500' of pliable, yet strong and durable 'thread' for joining the bark.







ANATOMY AND NOMENCLATURE OF A BARK CANOE

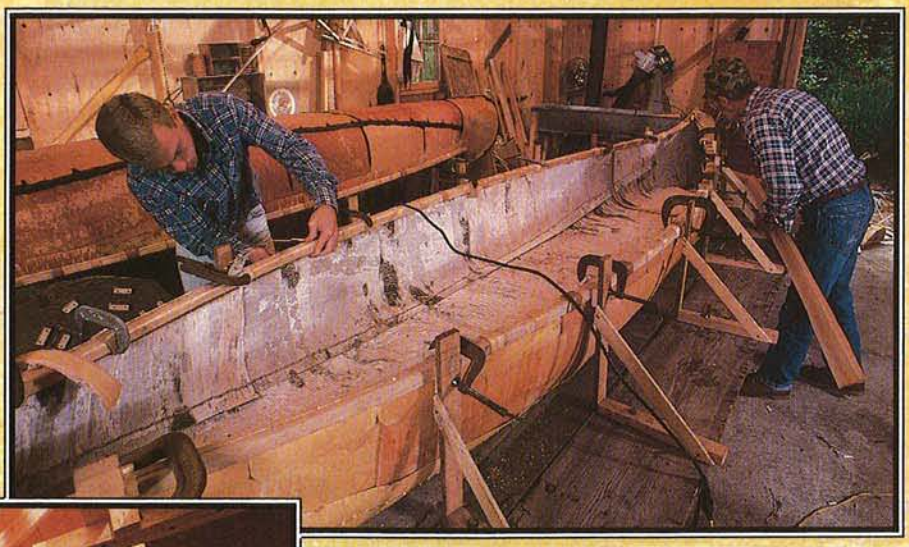
When warm June and July weather makes the sap run, birch bark peels easily. Atop a 6' homemade ladder, Jack makes a lengthwise slice down the trunk. With the bladepoint, he starts the peel. Once started, the bark sometimes seems to pop off the tree.

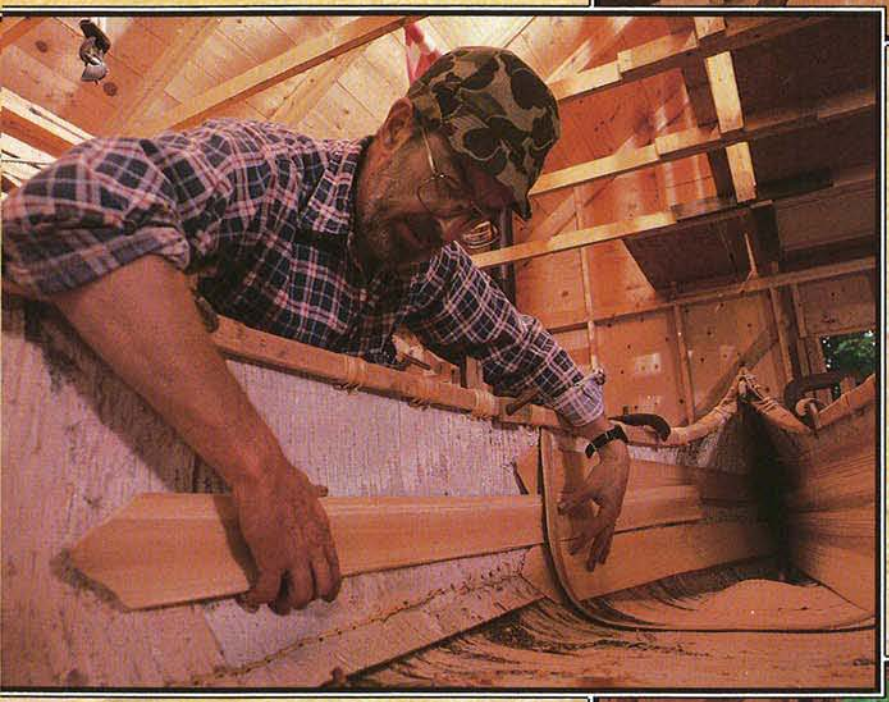
"I mate the bark by thickness on the sides so the pieces won't fight and askew the canoe," explains Jack. "And, I overlap the seam edges toward the stern." For the seam lacing shown here, Jack drills ¼" holes ⅞" apart in the bark, then weaves in the split spruce root.

THE BARK CANOE

In the 20th-century forest, Jack faces a different set of circumstances. The sea of second-growth birch from which he gathers bark runs small in diameter, so several trees contribute to a canoe. And, the trees grow in scattered stands.

"On one trip to the woods, I'll see maybe 150 birch trees," Jack notes as he trods the logging trail bordering the forest. "From those, I'll look at 25–30 up close, then maybe only five will be fit for peeling. Averaging it out, the bark for a single canoe probably comes off a square mile of birch trees."





▲ On the building bed, Jack and his son, Dave, raise the sewn-up, birch bark skin to the shape they want, secure it with braces, and lash on the gunwales. Indians, however, worked on the ground, using stakes to hold up the bark sheathing.

◀ Inside the canoe, cedar planks laid end to end cover the bark and protect it. Jack uses no fasteners or adhesives. Tension from the canoe's ribs will hold the planks tightly in place.

▼ To make the ribs pliable for insertion, Jack steams them in a mortar-like tube outside the shop. Then, he and Dave bend, set, trim, and insert each rib in the gunwales along the canoe's length.

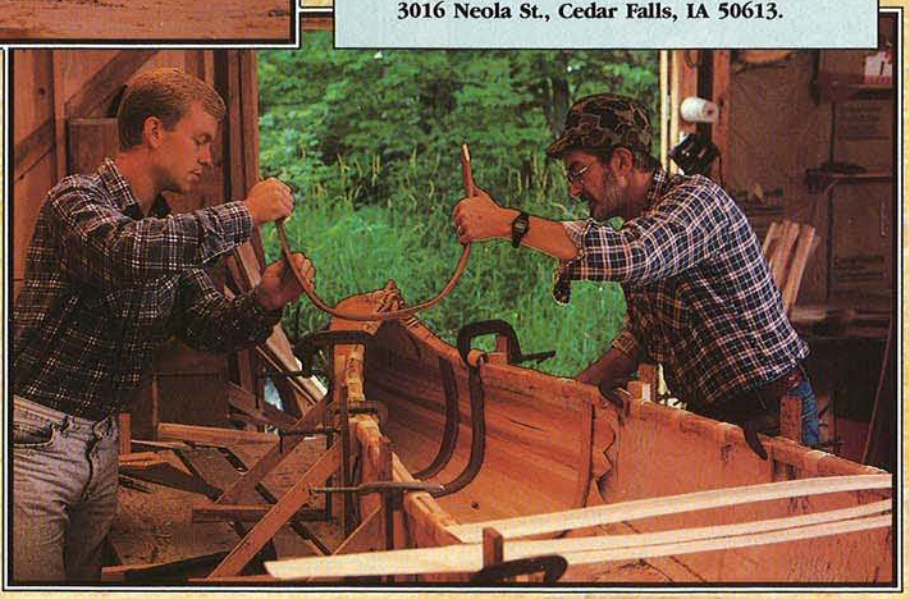
WRITE FOR CANOE INFORMATION

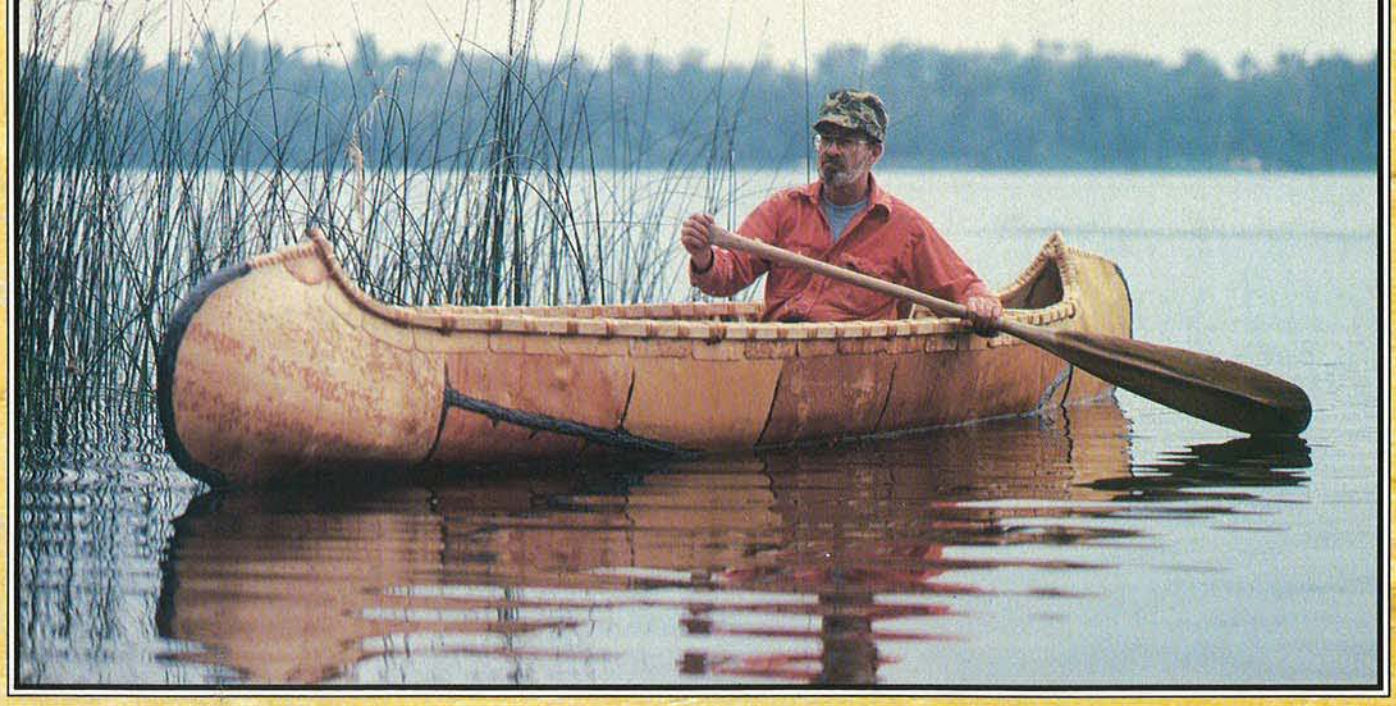
For a brochure describing Jack's birch bark canoes and current prices, send $1 and a self-addressed, stamped, business-sized envelope to:

Jack Minehart, Bigfork Canoe Trails,
3016 Neola St., Cedar Falls, IA 50613.

The woods-wise craftsman snaps his cap brim, waves away a pesky gnat, then glances to a birch's first branch. Eyeing it down, he cites some of the specifications: "I must have one that's at least 18" in diameter and straight. If I get one with a bow in it, the bark won't behave when I fold or work it."

Weather influences much of Jack's canoe building. Bark-peeling, for example, requires warm temperatures because sap flowing under the bark aids stripping. In northern Minnesota, barring cold snaps, prime time starts about mid-June and lasts until the end of July,



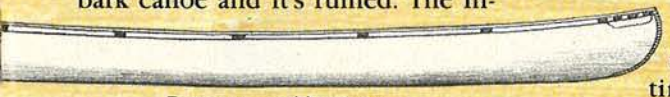


Its seams sealed with roofing cement and bark shrunken tight to the ribs, the canoe takes a maiden voyage.

coinciding with the annual muster of biting blackflies, munching mosquitoes, and toothy ticks.

Materials that come home to water

"All a canoe's materials are at home in dampness, and should be kept that way," advises Jack. "Dry out a bark canoe and it's ruined. The Indians filled theirs with rocks and sank them for the winter."



Passamaquoddy canoe

To make his point, he parts the tall weeds behind his shop to reveal the remains of two bark canoes sent to him for repair and restoration. Split, spotted, and decayed, the once-grand craft lie as if awaiting a decent burial. "Too late," he mumbles. "Museum curators varnished them. Material couldn't breathe or soak up moisture. A real mistake."

Jack disdains those who would abuse a bark canoe. Considering the effort that goes into collecting the materials—about five good-weather days of the 10 it takes to complete a canoe—you can't blame him. In addition to the birch bark—about 19 pieces for an average 16′ canoe—he requires a pile of goods from the lowlands.

In a full morning's sloshy work, Jack pulls 300′ of black spruce root from a bog for lacing and lashing. Then, there's the freshly felled white cedar he hand-splits for planking, ribs, thwarts, gunwales, and the curved stems at bow and stern. Even the bit of strong and pliable basswood bark he uses for protective wrapping requires a lengthy harvest time.

Gathering these natural materials sometimes includes peril. Like the time Jack lost his lapel compass on an overcast day and found his way out of the woods with his nose.

"After hours of trudging, I caught the scent of a barbecue," he says, chuckling. "I followed my nose until I walked out in a campground only a couple of miles from my cabin, but nine miles and six hours from where I entered the woods!"

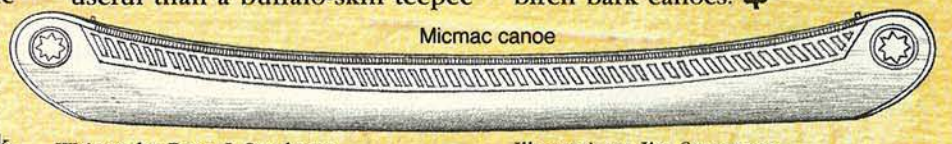
Canoes draw their strength from within

"The real strength and structure of the bark canoe come from its cedar components—the stems, gunwales, ribs, and planking. Without these, the boat would simply be a formless roll of bark, no more humanly useful than a buffalo-skin teepee without its supporting poles," Jack explains, glancing at the shimmering golden bark of the new, 50-pound, 16′ Chippewa-style canoe resting nearby. With the help of his visiting son, Dave, a coastguardsman stationed in Baudette, Minnesota, Jack raised, planked, and ribbed the bark skin in a weekend.

To Jack, the bark sheathing provides more than a tough, waterproof covering. It's beautiful.

"That always hits me when the canoe starts to shape up on the building bed," he notes, running his hand across a stray piece of bark. "Just prior to inserting the planking and ribs, the white side of the bark glows from within the boat. On the outside, in contrast, the backside of the bark looks like fresh buckskin. I can't help being moved by the sight."

In a decade of making canoes, that sight has warmed Jack about 35 times—once for each canoe he's labored over. He does, though, look to the future and many more "love-at-first-sightings." That's when he lays aside his high-school history books in retirement and occupies his lakeside shop full-time, building birch bark canoes.



Micmac canoe

Written by Peter J. Stephano
Photographs: Layne Kennedy
Illustrations: Jim Stevenson
Graphic Design: Perry A. McFarlin

Sand Blasted

Try it once and you'll be blown away

Print this article

Here at *WOOD*® magazine we'll experiment with most any technique, woodworking or otherwise, that we think will interest our readers. After discovering what a sandblaster can do (see some of our results at *right*), we couldn't wait to show you how to utilize this machine in your shop. So get out those air compressors—and get ready to blast off!

Wooden signs

Drinking glasses

How to talk like a master blaster

Have you ever noticed that every time you try a new subject area, the first thing you run up against is a lot of terminology you don't understand? We have! Sandblasting has its share of mysterious words, too, so here are some key definitions.

Abrasive—You've probably heard sandpaper referred to as an abrasive. In this case, the word refers to the tiny particles (sand or other fine, gritty materials) sprayed through the sandblasting gun. Abrasives chip away at the work surface to produce the desired effect. See the chart on page 36 for a list of abrasives.

Carving—By concentrating a stream of abrasive at one spot, you can lower or "carve" the surface of wood or glass.

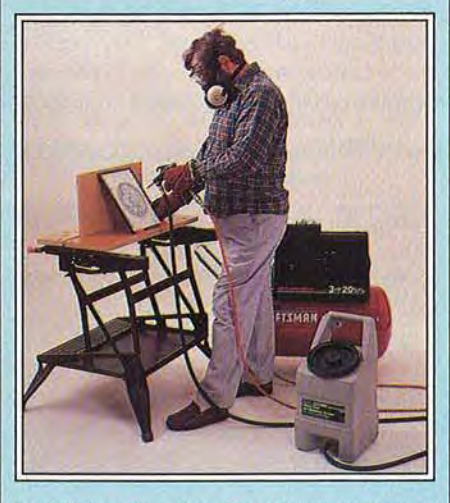
Etching—Also called surface etching, this process requires light, even sandblasting of glass or brass to give it a frosted look.

Siphon-fed sandblasters—Selling for less than $100, these widely available systems have two hoses leading to the gun: an air-supply hose from a compressor and a sand-supply hose hooked to the abrasive tank. You can purchase a reliable unit for less than $100.

Pressure-fed sandblasters—These units send abrasive under pressure from a tank to the sandblasting gun. They cost $300–$800 and cut faster, while using less air, than a siphon-fed sandblaster. You need this type of sandblaster only if you intend to carve glass or do sandblasting on a regular basis.

Resist—Any material that blocks the stream of abrasives from selected areas of a surface, leaving those sections unetched or uncarved.

A basic setup for safe and effective blasting



Sandblasters throw abrasive every which way, so try a setup like the one shown *above* on your driveway or lawn. Because these sand-throwing machines require a lot of air, hook them to a compressor of at least 2 hp and 20-gallon capacity.

For safety and comfort, wear face protection, a long-sleeved shirt, and gloves. Since blasting with any type of sand produces airborne silica dust, wear a dust-mask respirator when spraying these abrasives.

Blasting

Brass plaques

Ornaments

Cabinet doors

PROVEN TECHNIQUES FROM THE WOOD MAGAZINE SHOP — SHOP TESTED

GLASS: DISCOVER THE ENDLESS POSSIBILITIES

Like you, we're woodworkers at heart. But before we sandblast wood, we'd like to fill you in on the basics of working with glass. As we found out, you can achieve an almost unlimited variety of stunning effects and designs with this versatile material. Just remember not to use tempered glass—it could shatter during sandblasting.

Choosing and working with the right resist

To make sure you get off on the right foot, take a look at the chart at *right* to select the correct resist. As you can see, all of the resists except tempered hardboard work with glass. Then, follow these tips for adhesive-backed resists:

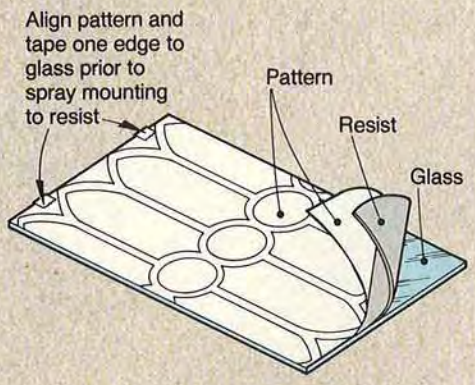
Opaque resists: These vinyl or rubber materials take the most time to prepare, but also give you the most accurate hand-cut reproductions of your pattern. For example, a geometric pattern such as the windowpane design on page 36 requires an opaque resist. To use these materials, try the method at the top of the following page.

GET THE RIGHT RESIST FOR THE JOB

RESIST	THICKNESS	USES	COST	COMMENTS
Clear vinyl	8–11 mils	Glass or brass etching	$.70–$2 per sq. ft.	Self-adhesive. Allows you to place pattern under glass and trace the design with knife. 8 mil adequate for normal etching.
Opaque vinyl	4–11 mils	Glass or brass etching	$.70–$1.25 per sq. ft.	Self-adhesive. Because pattern must be adhered to resist, this material gives a more exact reproduction of pattern. 6 mil adequate for normal etching.
Rubber	40–45 mils	Glass etching or carving, brass etching, woodcarving, boring holes in glass.	$1–$3 per sq. ft.	Self-adhesive. Easy to cut. Holds up to heavy blasting.
Photo masking	4–5 mils	Glass or brass etching	$.10 per sq. in.	Self-adhesive. Stock designs available. Custom masks available, using your artwork.
Tempered hardboard	¼"	Woodcarving	$8–$10 for a 4x8' sheet	Inexpensive. Same template can be reused. You must nail or tape template to work surface for every usage.

Continued

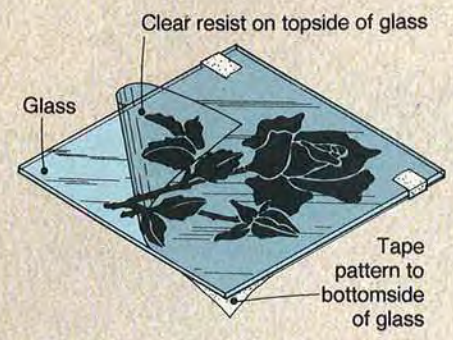
First, transfer the design to a sheet of plain paper. Next, cover the glass surface with a piece of the resist, avoiding as best you can any air bubbles underneath the vinyl or rubber materials. (The resist will be weaker in the areas of the bubbles, so pop them with a knife point and flatten again.) Then, place the design on top of the resist and align and tape it along one edge of the



glass as shown in the drawing *above*. Affix the pattern to the resist with a spray adhesive. With an X-acto knife, cut along the lines of the design, making sure the cuts overlap completely. To remove the appropriate areas of the resist, lift one corner with the knife and peel up as we're doing on the drinking-glass project shown *below*.

After lifting the edge of the resist with an X-acto knife, peel it away to expose the areas that receive sandblasting.

Clear resists: These vinyls save you some work by not requiring you to adhere the design to the top of the resist. You simply apply the see-through resist to the top surface of the glass, then slide the design under the glass according to the



drawing *above*. Then, tape the design in place beneath the glass. With an X-acto knife in hand, carefully cut the design through the resist. Finally, peel away the resist with the help of your X-acto knife.

Photo masks: To make a photo mask of your design, a supplier will transfer the design to a piece of photosensitive resist. The cost to you: the price of a photo positive of your design, plus an initial setup fee of about $20. That may sound expensive, but photo masks pay off if you intend to do several pieces of work with the same design. Why? You need only wet the backside of the mask, apply it, and that's all—you're ready to sandblast. The sandblasting supplier on page 39 provides this service as well as stock photo-masked designs.

How to etch, bore into, and cut glass

With the resist applied and cut, you've done all the hard work. Now, it's time for the fun part. To etch glass, first prop the workpiece on a small workbench. Set your compressor pressure according to the chart *below* and load your

QUICK GUIDE TO 4 SANDBLASTING APPLICATIONS

APPLICATION	COMPRESSOR PRESSURE	NOZZLE DISTANCE FROM WORKPIECE
Carving wood	40–100 PSI	2–3"
Weathering paint on wood	40–50 PSI	18"
Etching glass or brass	40–100 PSI	4–6"
Boring holes in glass	80–100 PSI	0–1"

NITTY-GRITTY ABRASIVE FACTS

ABRASIVE	APPLICATIONS	COST	COMMENTS
Fine white silica sand	Glass, wood, brass	$6–$8 per 100 lb.	Best for all-around use if you have no means of retrieving abrasive. Use respirator.
Common river or beach sand	Wood, glass	$4–$5 per 100 lb.	Abrasive must be clean and free of debris. Use respirator. Cuts slightly slower and creates rougher texture than fine white silica sand.
Aluminum oxide	Glass, brass	$1–$3 per lb.	Use only if abrasive can be recycled. Retains sharpness through repeated applications.
Silicon carbide	Glass, brass	$1.50–$5 per lb.	Available in very fine grits. Economical only if abrasive can be retrieved and recycled. Best retention of sharpness through repeated applications.

sandblaster with abrasive. We suggest using the finest white silica sand you can find (similar to the white sand often found in ashtrays). If your local homecenter or hardware store doesn't carry this abrasive, look under *sandblasting* in the Yellow Pages. See the chart at the bottom of the previous page for more abrasive information.

Now, move the sandblasting gun in sweeps across the glass surface as shown *below*. Be sure to overlap your sweeps, and check periodically for evenness of the frosting effect. That's it! Just peel away the resist to reveal your work of art. The same method works with brass. (We etched the soccer ball onto the plaque on page 35.)

To bore holes in glass, or cut the material into various shapes, concentrate a stream of abrasives in one area until it cuts all the way through. To make the butterfly ornament on page 35, first etch the inner-wing design, then cut away the butterfly from a pane of glass as shown *below, middle*. Because stained glass cuts slowly due to its hardness, adjust your compressor to 90–100 psi for effective results.

Etching flashed glass: A colorful alternative

Although flashed glass looks like stained glass at first glance, sandblasting the flashed variety quickly reveals that it's colored on only one side. By etching the colored or "flashed" side, you can create brilliant designs such as the one *above*. Many stained-glass shops sell flashed glass, but remember to keep these important points in mind:

- You'll pay a handsome price for flashed glass: about $15 per square foot. So, practice on other glass before trying the flashed variety.
- You must apply the resist to the flashed side. Normally, the flashed side is opposite the side that has tiny bubbles near the surface.

Sandblast the glass in overlapping sweeps for even coverage.

With a sandblaster, you can cut intricate shapes precisely and quickly.

Air erasers: The tool for small blasting jobs

If you only want to etch an occasional small project, here's a lightweight "sandblaster" that you can use in the comfort of your shop. The Paasche AEC-K air eraser won't cut glass or carve wood, but for $77, it lets you etch glass or brass with even the smallest of compressors. Instead of spewing out sand, the air eraser requires small amounts of aluminum oxide. Six ounces of the abrasive will etch 10 or so glasses. For a source, see the handy Buying Guide on page 39.

Paasche air eraser

Continued

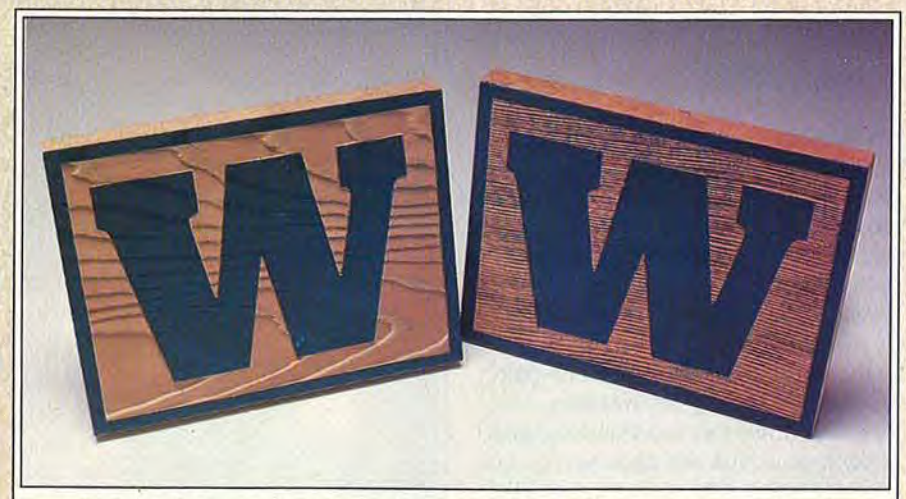
WOOD: STUNNING EFFECTS IN MINUTES

What to know before you blast wood

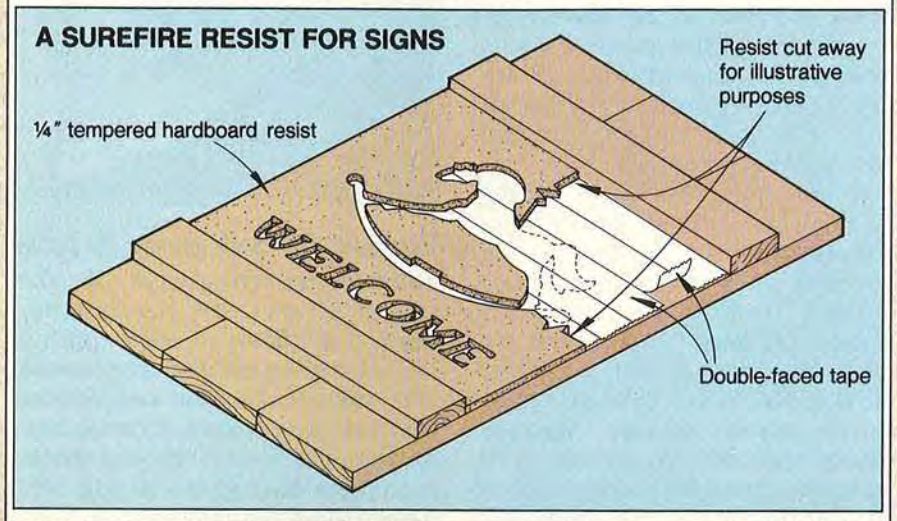
Although similar to the process for etching glass, carving in wood does require you to pay attention to the grain pattern of the workpiece. As shown in the two examples at *right,* sandblasting removes the softest grain first, giving dramatically different results on face and edge grain. We had good success sandblasting redwood and cedar—two ideal woods for outdoor signs—but had little luck carving hardwoods. Remember, the harder the wood, the more time and abrasive you'll spend carving it.

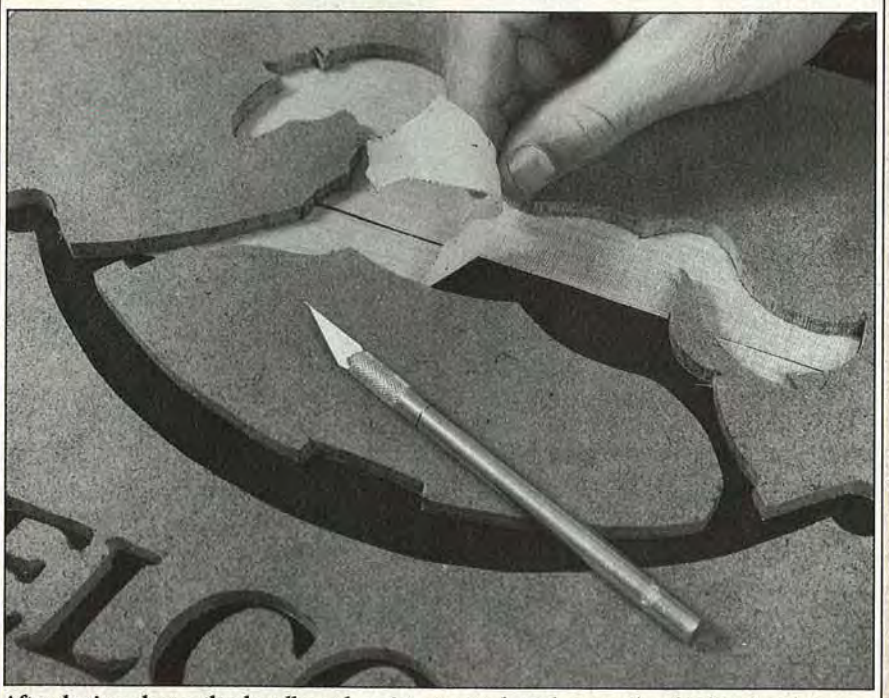
One slick way to make a sign

We don't know of any sign-making technique that's easier to control—or produces more impressive results—than sandblasting. And there's more than one way to go about it. One way: Apply and trace your pattern onto a piece of rubber resist just as you would do with glass. That works fine, but here's a less expensive method. First, transfer your pattern to a piece of tempered hardboard. With a scrollsaw, cut out the areas you want to blast. Then, apply cloth-backed, double-faced tape to the backside of the hardboard resist and adhere this assembly to the surface of your workpiece as shown at *right, middle.* You could nail the hardboard in place, but keep in mind that this will leave small brad holes in the work surface. To make the welcome sign on page 39, first paint the entire surface, then apply the resist, and cut along the pattern edges to remove the unnecessary tape as shown at *right.* Finally, sandblast the unprotected areas to a depth of about ¼". Work the blasting action into all the tight areas.



Face- *(left)* and edge-grain pieces of redwood have different sandblasted looks.





After laying down the hardboard resist, cut and peel away the double-faced tape.

Pattern shown *above* is half-sized.

How to achieve the weathered look

After carving the welcome sign, we kept our handy sandblaster nearby for the final touch: a two-minute weathered look. Here's how you can achieve the same effect. First, keep in mind that the natural causes of weathering—rain and sun—strike objects at high angles, so hold your sandblasting gun at a 45°–60° angle above the sign. Then, give the sign a light overall blasting. Finally, give a little extra blasting to the edges most likely to take a beating from Mother Nature.

Buying Guide

• ***Paasche AEC-K air eraser*** kit with six ounces of abrasive, $76.95 ppd. from The Art Store, 600 Harding Road, Des Moines, IA 50312.

Further reading and sandblasting supplies

• ***Glass Etching: Surface Techniques and Designs,*** by Norman Dobbins & Debra Felberg Oxley, $15.45 ppd. This book, instructional videos, seminars, and a complete line of sandblasting supplies (including photo masks, abrasives, resists, sandblasters, and air erasers) available from National Sandblast Systems, 20721 Marilla St. Chatsworth, CA 91311. Call 818/341-0301 for more information. Call 800-332-3824 for orders only.

Written by Bill Krier
Technical consultant: James R. Downing
Photographs: Jim Kascoutas
Illustrations: James R. Downing; Kim Downing; Mike Henry

Have a blast with these *Free* patterns

To help you get in on the fun of sandblasting, we'd like to send you a set of patterns for the drinking glasses, welcome sign, roses, and butterfly shown in this article. Just send us a stamped, self-addressed, No. 10 business-sized envelope to:

What a Blast!
***WOOD* Magazine**
P.O. Box 11454
Des Moines, IA 50336-1454

Foreign readers, please include an international reply coupon.

Print this article

SANDBLASTED WALL CLOCK JUST IN THE

Have some fun with this project! Blast away the numbers for the classy clock shown at left. Or, blast and paint the background and make your own wooden hands for the clock shown below left.

Note: Unless you're already familiar with sandblasting, refer to our techniques article starting on page 34. It provides helpful suggestions for masking the surface and blasting the mirror for this clock's face. For ease in masking the mirror, order our precut vinyl resist.

Miter-cut the pieces, and form the frame

1 Cut a piece of stock (we used pine) to 1½×1½×38". Follow the two-step drawing *below right* to miter-cut the 12 frame members 2⅞" long. (We first cut and dry-clamped 12 pieces from scrap to check the angle.)

2 With a band clamp, glue and clamp together the pieces with the top and bottom surfaces flush.

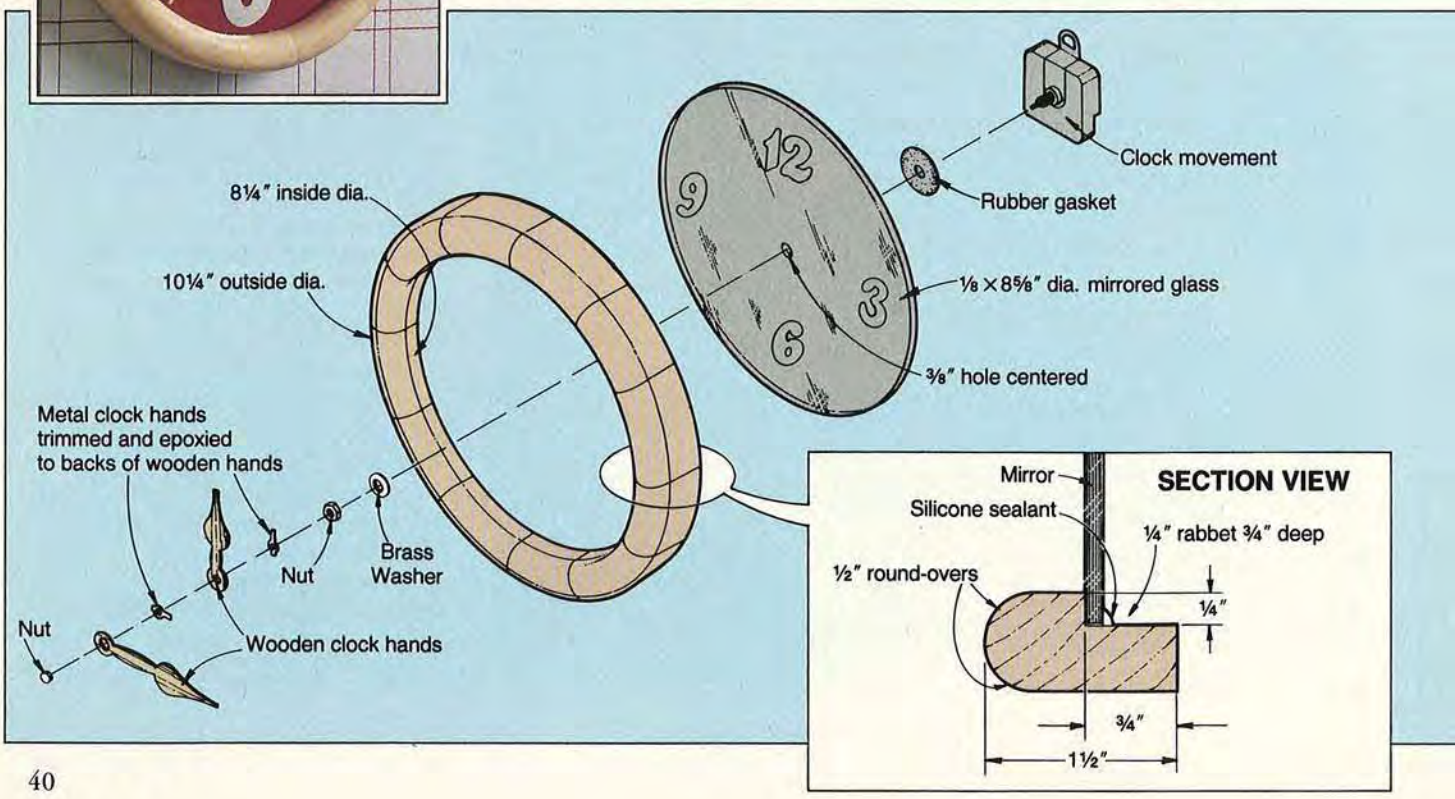
3 Remove the clamp and sand the top and bottom surfaces flat.

4 Tape the frame to your workbench as shown in the photo *right*. Mark lines across the scrap block to locate the center as shown.

5 Using trammel points, mark a 10¼"-diameter circle for the outside frame perimeter and an 8¼"-diameter circle for the inside.

6 Bandsaw the outside of the frame to shape and use a scrollsaw to cut the inside. Sand the cut edges smooth. (We used a disc sander to sand the outside and a drum sander to sand the inside.)

7 Rout a ½" round-over along both front edges of the frame. Switch to a ¼" rabbeting bit, and rout the back inside edge of the frame to house the clock face (mirror). Then, have a ⅛"-thick mirror cut to fit the rabbeted opening.

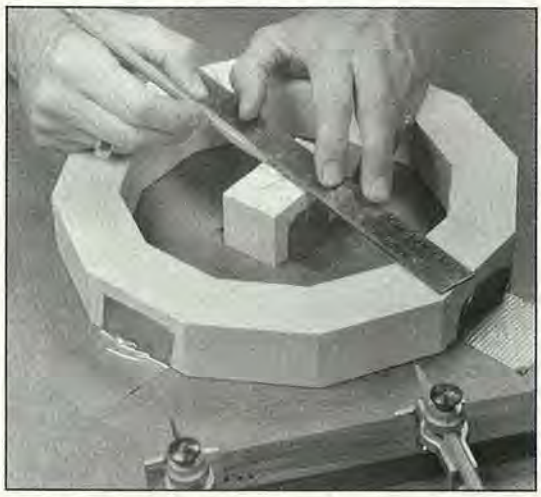


NICK OF TIME

Finish the frame and blast away

1 Hand-sand the frame smooth and finish as desired. (We left ours natural and applied several coats of spray-on lacquer.)

2 Clean the silvered side (back side) of the mirror. Find the center of the mirror and mark a centerpoint. With a hobby knife, cut around the marked hole at the center of the resist, and remove the center from the resist (see the Buying Guide *below right* for our resist source). Slowly peel the backing (brown paper) from the resist. Peel the resist slowly to prevent the numbers and background from sticking to the backing. Center the resist over the mirror's centerpoint, smooth out any bubbles, and adhere the resist to the silvered side of the mirror.



Position a straightedge on opposite joints and mark a line on the scrap block. Repeat the process with another set of joints to find the frame's center.

3 Center and tape a ⅜" flat washer over the hole in the resist. (The washer allows you to blast through the mirror without destroying the resist and making the shaft hole too large.)

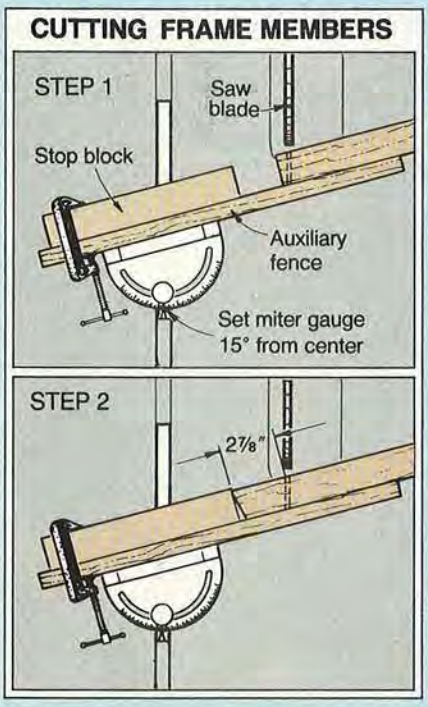
4 Sandblast a hole through the mirror at the washer (it took us approximately 4 minutes at 100 psi.). Insert the clock shaft through the hole to check for a good fit, and blast more if necessary.

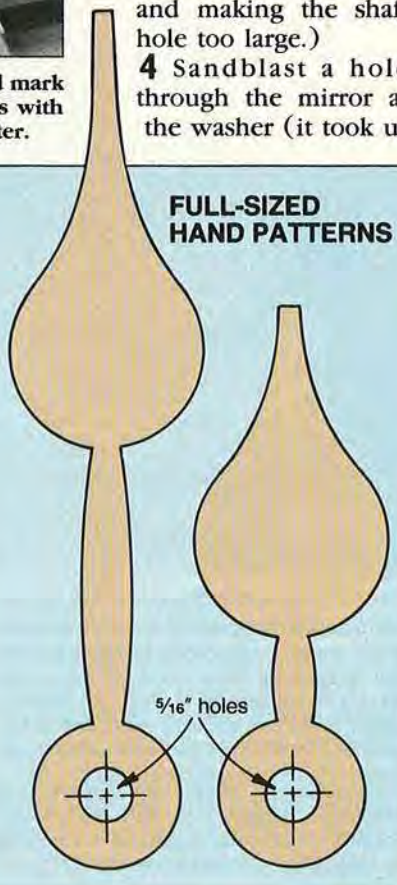
5 For the painted clock face (the clock with wooden hands), remove the background resist and leave the numbers adhered to the mirror. For the unpainted clock, remove the numbers and leave the background. Sandblast the unprotected areas.

6 For the painted version, resaw pine stock to 1/16" thick. Transfer the hand patterns *below left* to the thin stock. Drill a 5/16" hole in each hand where marked. Using a scrollsaw, cut the hands to shape. (To prevent splintering, we taped the pine stock to ¼" hardboard with double-faced tape. After cutting the hands to shape, we removed the hands from the hardboard by splashing a bit of lacquer thinner onto the taped joint to release the wooden hands from the tape and hardboard.)

7 Trim the metal hands where shown on the Exploded-View Drawing. Epoxy the wood hands to the front of the metal hands and attach them to the shaft. Fasten the movement to the mirror and attach the hands. (You'll need to trim about ½" off the ends of the black hands for the unpainted clock.)

8 Using hot-melt adhesive or silicone sealant, secure the mirror into the rabbeted frame.





Buying Guide

- **Vinyl resist.** Peel apart resist with pre-cut numbers. $6.25 each, or two for $10.45 ppd. Herrington Display Ltd., 1312 Maple, West Des Moines, IA 50265.
- **Clock movement.** High-torque movement with black hands, kit no. 71043, $15 ppd. Klockit, P.O. Box 636, Lake Geneva, WI 53147. Or, call 800-556-2548 to order.

Project Design: James R. Downing
Photographs: Hopkins Associates
Illustrations: Kim Downing; Bill Zaun

CHICAGO-AREA REFINISHER BILL AITCHISON

THE EVER-CLEAR,

After 30 years of painting and furniture finishing, Bill Aitchison, 50, could see the writing on the wall. His mind spun and his body reeled following every bout in the spray booth with traditional, petroleum-based, nitrocellulose lacquer. "My body was really telling me something," the Bedford Park, Illinois, craftsman recalls. "I got sick of being sick. I didn't need OSHA [Occupational Safety and Health Administration] to warn me."

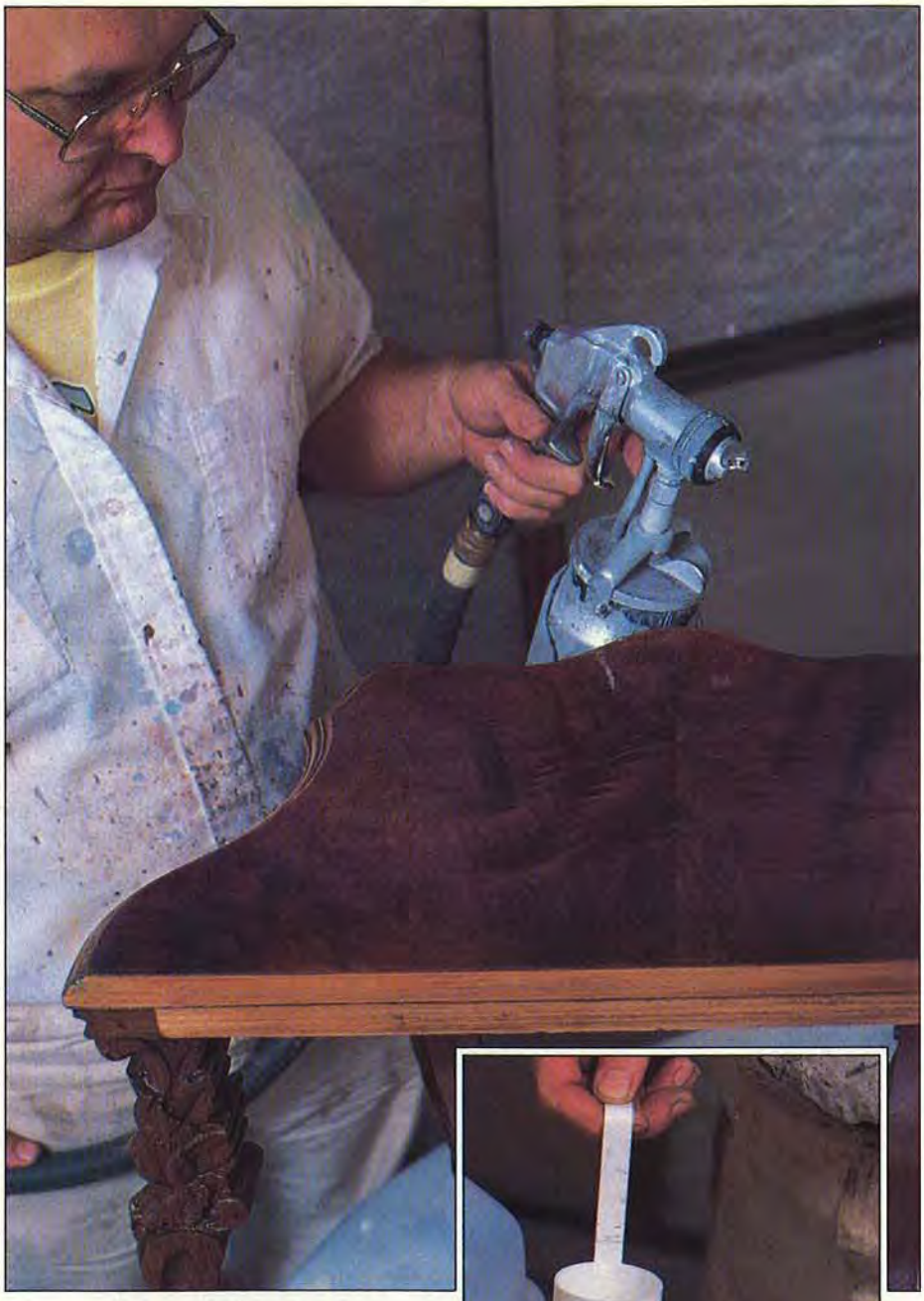
He also could see the day when state and federal legislation would lower the boom on time-proven finishing methods—ones learned from his father. "I knew laws were coming down the road, like what California has done to limit emissions in the finishing industry. I had to change or quit." (See editor's note, *next page.*)

Today, even though he's spraying more than ever, Bill doesn't feel dizzy or nauseous, and no pungent odor pervades his workspace. In fact, he even recirculates the air vented from the booth through the shop to reduce his heating bill—without fearing explosion and fire. His finish: a water-based lacquer.

Clear quality to count on

"I started using Amity Clear Gloss after reading about it in a trade magazine. The article said it not only was safe because it was water-based, but also nonyellowing," Bill explains. "Somewhat suspicious, I took a two-hour drive to the company's headquarters to find out more. After a demonstration, I decided that it seemed to work."

Back in his shop, Bill put his newly discovered product to the test. "I took pieces of walnut, oak, and maple, and cut them in half," he remembers. "Next, I put them on the spray table and made one pass with the nitro-cellulose. Then, I let them dry, sanded them, and put down a finish coat."



▲ **Furnace filters shield the fan in Bill's spray booth. Although OSHA requires that a mask be worn, and the manufacturer recommends it, Bill sometimes leaves it behind because water-based lacquer isn't toxic and has little overspray.**

▶ **Air pressure affects the spraying of water-base lacquer, so Bill must occasionally check the material's viscosity by seeing how fast it flows.**

Print this article

FINDS HAPPINESS WITH WATER-BASED LACQUER
NEVER-FEAR FINISH

Bill duplicated the treatment using the water-based lacquer, and was dumbfounded by the outcome. "The water-based gloss had twice as much build. The company claimed that it would, but I had to find out for myself." [Amity spokesman Randy Reek says that their water-based lacquer contains 30–40 percent solids, compared to 15 percent in nitro-cellulose lacquer.]

And clarity? Bill has found water-based lacquer to be so clear that he has to account for it in staining. "People expect wood furniture to have a yellowish cast. To get that look with water-base, I have to add yellow to the stains," Bill notes.

In addition to its nonyellowing nature, Bill's favorite finish has proved tough and durable, too. "I've been spraying it for two years now, and not one customer has brought back a piece because the finish didn't hold up," he says. "And I mean tabletops that take abuse with meals and homework."

"Water-based lacquer is the answer to everything—your health, safety, the environment, and a real smooth piano-like finish that looks 30 coats deep."

Bill Aitchison, Bedford Park, Illinois

Mastering a new approach

Once he trusted the water-based lacquer, Bill embraced the system. Although he could have stuck with his conventional compressor to spray the new finish, he spent about $700 for a low-pressure turbine spraying system—one that utilizes an airflow of 90 cfm to atomize the finish rather than compressed air—to take the greatest advantage of the product's high-solid content and keep overspray to a minimum (see Buying Guide at the end of the article). An airflow sprayer lays down 80 percent of the finishing material. A traditional compressor nets about 40 percent.

He built an 8×10′ spray booth, too, with the efficient but noisy sprayer turbine outside. For ventilation, he added a chimneylike flue fitted with an ordinary window fan and shielded by inexpensive furnace filters. The filters capture the few solids left in the air and keep them off the fan.

Editor's Note: In some California metropolitan air districts, Rule 1136 limits the amount of air-pollutants released by finishing products by lowering their volatile organic compound (VOC) content to 2.33 lbs per gallon. A gallon of nitro-cellulose lacquer contains from 5 to 7 pounds while a water-based lacquer such as that used by Bill has only 2.1 pounds. Similar limits have been set in other cities and states.

If you or one of your friends use a finishing system you'd like to crow about, why not drop us a line?

Write to:
"In Search of the Perfect Finish"
P.O. Box 11454
Des Moines, IA 50336-1454

Who knows, maybe you'll be featured in the next article.

Before spraying either the water-based sanding sealer ("That gives the gloss something to bite into") or the gloss, Bill measures how the material flows. "Atmospheric pressure affects its flow," says Bill, "so you have to check the material's viscosity [thickness or thinness]."

Bill determines viscosity by pouring a small amount of the material into a flow-out cup. With a stopwatch, he measures how fast it empties. "If the cup empties in under 18 seconds, it's fine," Bill advises. "If it takes longer, then I have to thin it with water."

Atmospheric pressure affects water-based lacquer by making it flow slower, but humidity has no effect because the lacquer's a water-born material. "In high humidity, nitrocellulose lacquer traps moisture, causing what's called blush," Bill says. "You have to add blush retarder to slow drying and allow the moisture to escape. Humidty doesn't bother water-base. In fact, it seems to perform better."

All set to go, Bill switches on the ventilating fan and begins laying down lacquer. "I usually put on three or four coats," he notes, "but that doesn't mean laying down a coat and letting it dry, then spraying another coat. With this stuff, you spray on wet coats. I make a pass, then do it again, then do it again. And, if I have a big run or something, I just take a sponge and water and wash it off. That is, if I repair it within two minutes, because it sets up in three minutes, hardens in an hour, and takes four days to cure."

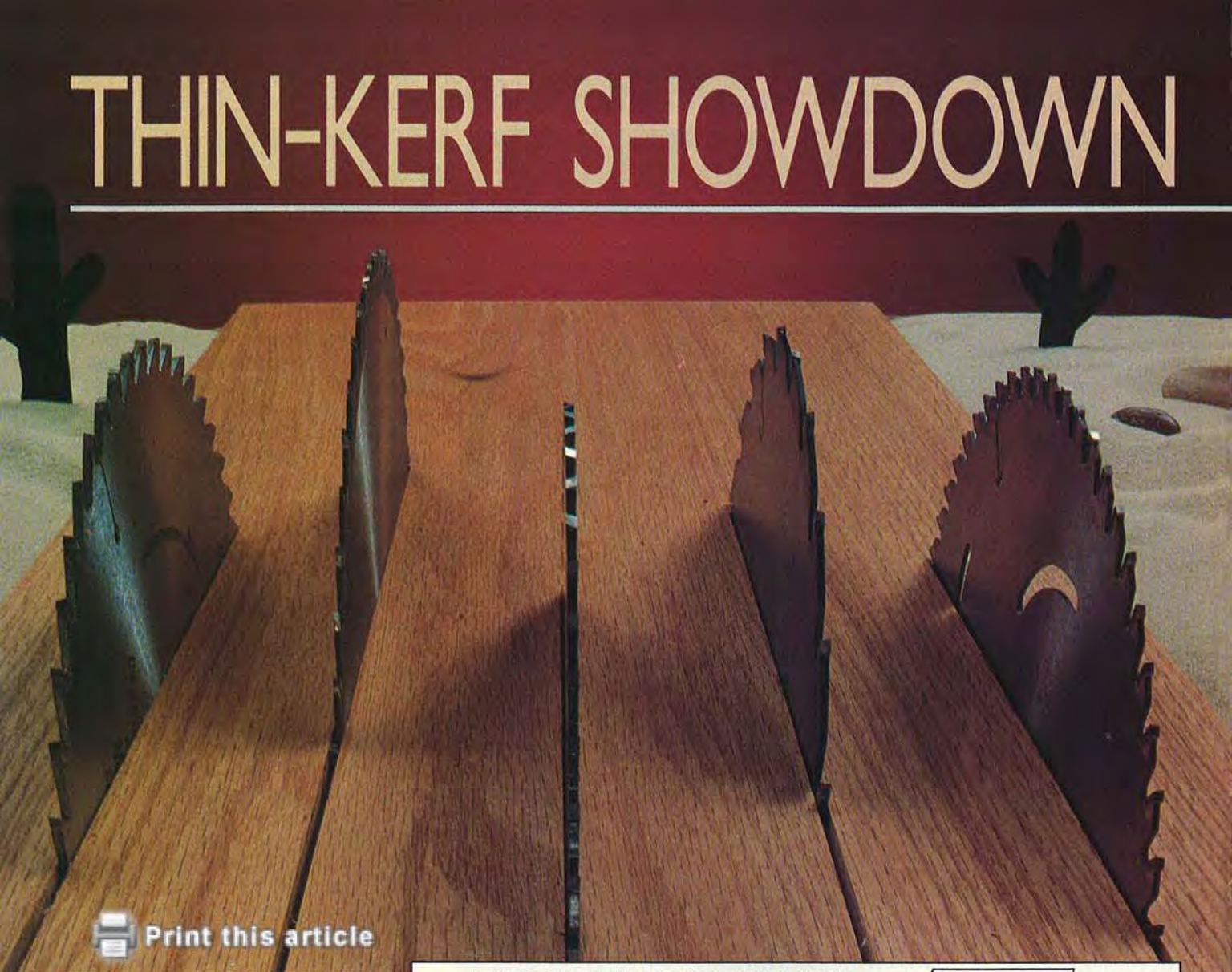
Cleanup may be the part of spraying that irks craftsmen the most. Yet, to Bill, it's a snap. "I just walk over to the deep sink and rinse the gun out with warm water. Then, every month or two, I'll take the nozzle apart and soak it in regular lacquer thinner to cut the build-up. But it couldn't be easier."

Buying Guide

For information and dealers of the Amity line of brush-on, spray-on water-based finishes and sprayers, write *Amity, P.O. Box 148, 1571 Ivory Drive, Sun Prairie, WI 53590. Or, call 800/334-4259 (Wisconsin residents: 608/837-8484).*

Photographs: Richard Faverty

THIN-KERF SHOWDOWN



Print this article

This Jim likes his blades thin

Jim Downing

Jim Downing had a dilemma. To cut the deck planking for his 30-foot sailboat, *WOOD*® magazine's design editor had to make 3,000 feet of cuts through 18'-long, 1½"-thick teak boards. Jim knew a standard, ⅛"-kerf blade most likely would bog down as he fed the hard teak material through his 1½-hp saw.

His solution: a Freud 24-tooth, thin-kerf ripping blade. "The blade made smooth cuts without heating up," Jim says. "And the saw's motor never pulled down. Since I cut the planking into 3/16" strips, the thin-kerf blade saved me a lot of stock."

THIN-KERF BLADES THAT PERFORM

Style	Manufacturer/ retailer	Model	Teeth	Kerf (inch)	Smoothness of cut (Fair = ★ Good = ★★ Great = ★★★)	List price[1]	Selling price
Crosscut blades	DML	Ultra-Thin DT 1000	80	7/64	★ ★	101.00	N/A
	Forrest	Woodworker I	60	7/64	★ ★ ★	162.00	97.00
	Freud	LU88M	60	7/64	★ ★	73.90	52.00
	Systi Matic	Thin Line 10PT60-050TL	60	6/64	★ ★ ★	92.00	N/A
	Woodcraft	07L62	50	7/64	★		64.50*
Rip blades	Forrest	Woodworker II—Thin Line	30	7/64	★ ★ ★	135.00	81.00
	Freud	LU87M	24	7/64	★ ★	59.90	42.00
	Oldham	Roadrunner	36	7/64	★	41.35	N/A
	Systi Matic	Thin Line 10HR20-050TL	20	6/64	★ ★	50.75	N/A

1. List prices. Actual selling prices 10-50% lower

* Postage-paid price

MANUFACTURERS LISTING:

DML
800-233-7297
In Ky.: 502/587-5562

Forrest Manufacturing
800-733-7111
In N.J.: 201/473-5236

Freud
800-334-4107

Oldham/U.S. Saw Co.
800-828-9000
In N.Y.: 716/778-8588

Systi Matic
800-426-0000

Woodcraft
800-225-1153
In W.Va., Alaska, and Hawaii call 304/428-4866

HERE ARE THE BLADES THAT PRODUCE THE THINNEST AND CLEANEST CUTS

If you're looking for a way to get more power from your tablesaw, then let a thin-kerf blade to come to your rescue. As we found out in our tests, thin-kerf blades require less power than thicker-bodied blades to make the same cuts. And, that's especially important if, like many of us, you own a 1½-or-less hp saw that occasionally bogs down. As we began the research for this article, all but one manufacturer we contacted said, yes, they offer a 10" thin-kerf blade in their product line. Guess what? Of the 18 blades we tested, only nine of them met our requirement that the blade produce a kerf no wider than 7/64". (That's why many blades don't appear on the chart at *left.*) Although some of the blades appeared thin, they wobbled so much on our tablesaw that they left a kerf that was anything but thin. Experienced woodworkers often refer to this sort of wobble as *runout.* To get an idea of what excessive runout does to the cut surfaces of your workpieces, see the photo *above middle.*

Do you need a thin-kerf blade?

Improved manufacturing procedures, such as laser-cutting the blade bodies, and higher-quality materials, have increased the quality of all blades. Thanks to these innovations, thin-kerf blades now produce the kind of clean cuts that woodworkers expect. In fact, most manufacturers we spoke to anticipate that these blades will make up an ever-growing percentage of their sales. However, keep in mind that these blades won't take the kind of abuse that thicker-bodied blades will. As Keith Deitrich, an engineer with Systi Matic, told us, "You wouldn't take a $50,000 Mercedes into four-wheel country, and you can't use an 80-tooth thin-kerf blade for ripping 2"-thick oak without some damage to the blade."

A blade with excessive runout caused the coarse edge on the ripped Honduras mahogany at *left.* The other edge shows the result of minimal runout from a Forrest blade in the same board.

What we uncovered in our tests

You probably don't pull out a compressor and blow off your saw's arbor and arbor collars when you change a blade, but we did to make our test results as accurate as possible. Then, we ran all the blades in red oak and Honduras mahogany.

As you can see by the chart at *left,* the more you spend on a thin-kerf blade, the better you can expect it to perform. So, we wondered what blade characteristics were common to the better-performing blades. Here's the first thing we noticed: All of the better blades had 3 to 5 expansion slots along their rims. Manufacturers told us that because thin-kerf blades have less body mass to absorb heat, they need slots to help the blade expand and cool. As the photo at *top right* shows, Freud and Systi Matic have built additional innovative solutions into their blades. Freud's thin-kerf blades also have a friction-reducing Teflon coating. Systi Matic lasercuts cooling slots into the saw's body to prevent overheating.

In the final analysis, we felt the Forrest blades produced the best cuts, and that's not surprising considering their relativly high prices. If you want smooth cuts, and the thinnest kerf possible, the Systi Matic blades produced the only 9/64" kerf in our tests. The Freud LU87M ripping blade performed well also, and seemed to cut with the greatest ease of all the blades.

Freud, *background,* adds a black Teflon coating and expansion slots to its thin-kerf blades. Systi Matic's blades, *foreground,* have expansion *and* arch-shaped cooling slots.

Stabilizers: A helping hand for any blade

Forrest stabilizers improve the performance of thin-kerf and full-bodied blades alike.

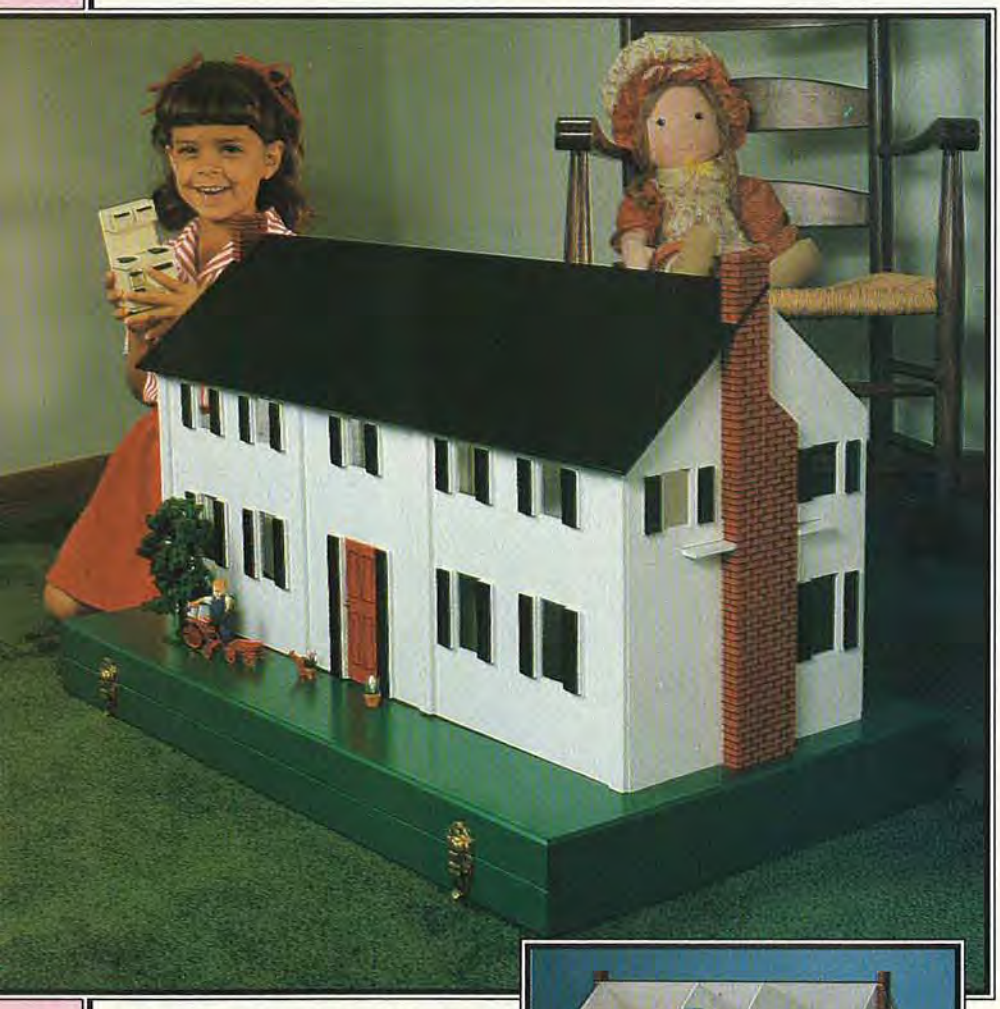
Along with their blades, Forrest and DML sent us samples of their stabilizing collars. Both manufacturers told us that the collars reduce runout and blade noise. After testing these thin metal discs, we agree. Both of the products improved the performance of low- *and* high-quality thin-kerf blades.

Forrest sells 4", 5", and 6" single discs that you slide onto the saw's arbor between the blade and arbor nut. DML sells the discs in pairs in 4" and 6" sizes. DML suggests mounting one stabilizer on each side of the blade. For these handy gadgets, you'll pay $21–$25 for a single Forrest stiffener and $12–$16 for a pair of the DML collars.

Written by Bill Krier
Technical Consultant: Bob Yapp
Photographs: Hopkins Associates; Bob Calmer

DOLLHOUSE IN

PLAYTIME FUN THAT PACKS AWAY WHEN THE KIDS ARE DONE



Readers who tour the WOOD® magazine offices love to peek at projects we're preparing for upcoming issues. When Terry Edens of Davenport, Iowa visited us in August and spotted our dollhouse he said, "Boy, that's just what I've been looking for! My kids have said that the granddaughters don't have room for a dollhouse that they'd have to keep out all the time. But this is perfect. When can I start building?" Sorry to keep you waiting, Terry. But it takes time to verify all the dimensions, illustrations, and how-to instructions in our projects. I hope you and others have as much fun building this as we did. And, when playtime is over, all the pieces fit neatly into the handy case.

Print this article

Marlen Kemmet how-to editor

Note: See the Buying Guide on page 55 for our source of plans for the dollhouse furniture shown.

Call the framing crew to erect the walls

1 Using the dimensions on the Parts View Drawing on page 53, lay out the dollhouse front (A), side walls (B), partitions (C), and second floor (D) onto a 4×8 sheet of ¼"-thick birch plywood. Refer to the Cutting Diagram shown on page 53 for positioning the pieces on the plywood. Be sure to mark the window openings, door openings, and slots on the six pieces as you lay them out.

2 With a utility knife and a straightedge, score all of the lines you just marked. Doing this will minimize splintering when you cut out the pieces. Using a jigsaw fitted with a fine-toothed plywood-cutting blade, cut the parts to shape.

3 Drill blade-start holes, and cut the openings and slots to size. Check the fit of the mating parts in the slots; adjust if necessary.

4 Cut the roof (E) to the size listed in the Bill of Materials.

And now, add the trim

1 Cut the columns (F), window shutters (G, H), and door shutters (I) to the sizes listed in the Bill of Materials. Sand the edges smooth.

2 Glue and tape the columns and shutters in place (we used spring clamps and masking tape to hold the pieces until the glue dried). Note the position of the outside columns where shown on the Hinge Detail in the lower right-hand corner on the opposite page.

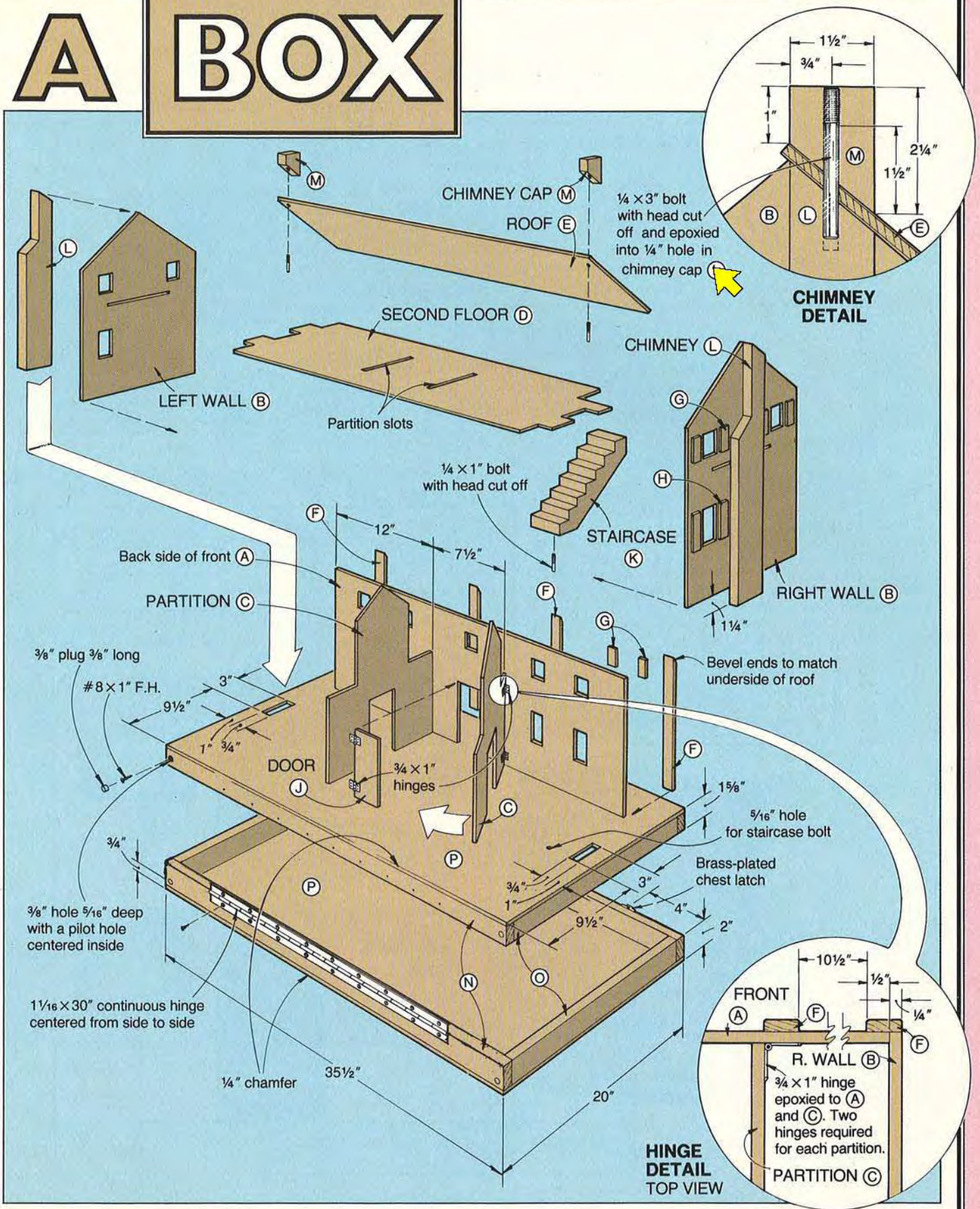
3 Cut the front door (J) to size, and set it aside for now.

Assemble the pieces for home sweet home

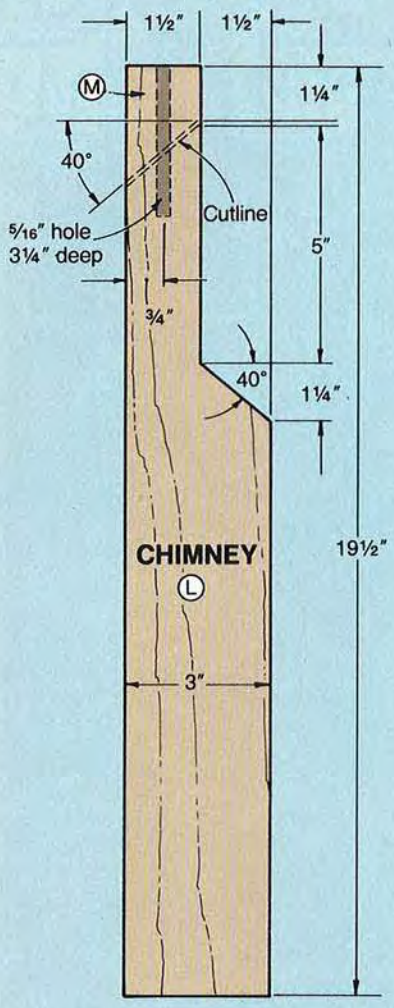
1 Insert the partitions (C) into the slots in the second floor (D).

Continued

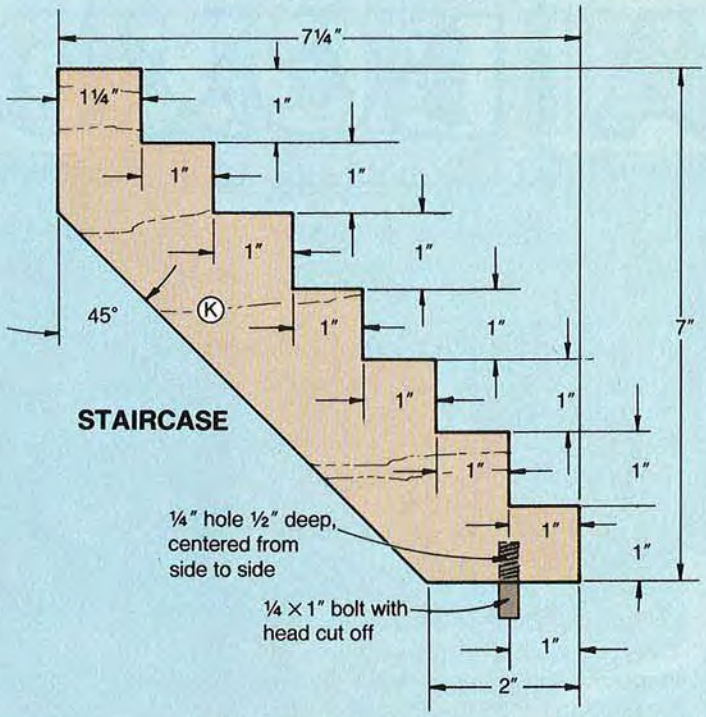
A BOX

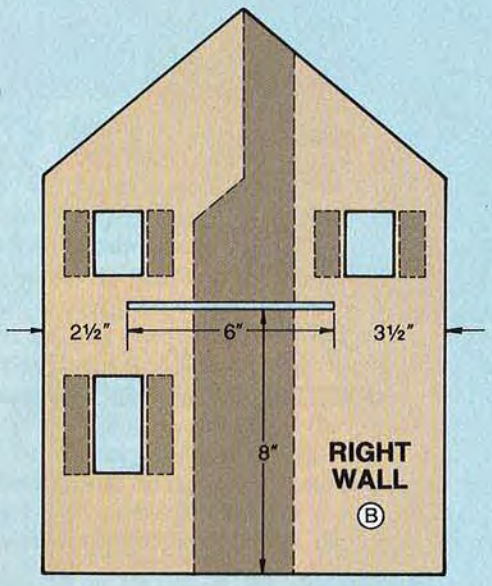

CHIMNEY CAP M
ROOF E
¼ × 3″ bolt with head cut off and epoxied into ¼″ hole in chimney cap
CHIMNEY DETAIL
SECOND FLOOR D
CHIMNEY L
LEFT WALL B
Partition slots
¼ × 1″ bolt with head cut off
STAIRCASE K
RIGHT WALL B
Back side of front A
PARTITION C
Bevel ends to match underside of roof
⅜″ plug ⅜″ long
#8 × 1″ F.H.
DOOR J
¾ × 1″ hinges
⅝″ hole ⅝″ deep with a pilot hole centered inside
1 1⁄16 × 30″ continuous hinge centered from side to side
¼″ chamfer
5⁄16″ hole for staircase bolt
Brass-plated chest latch
HINGE DETAIL TOP VIEW
FRONT A
R. WALL B
¾ × 1″ hinge epoxied to A and C. Two hinges required for each partition.
PARTITION C

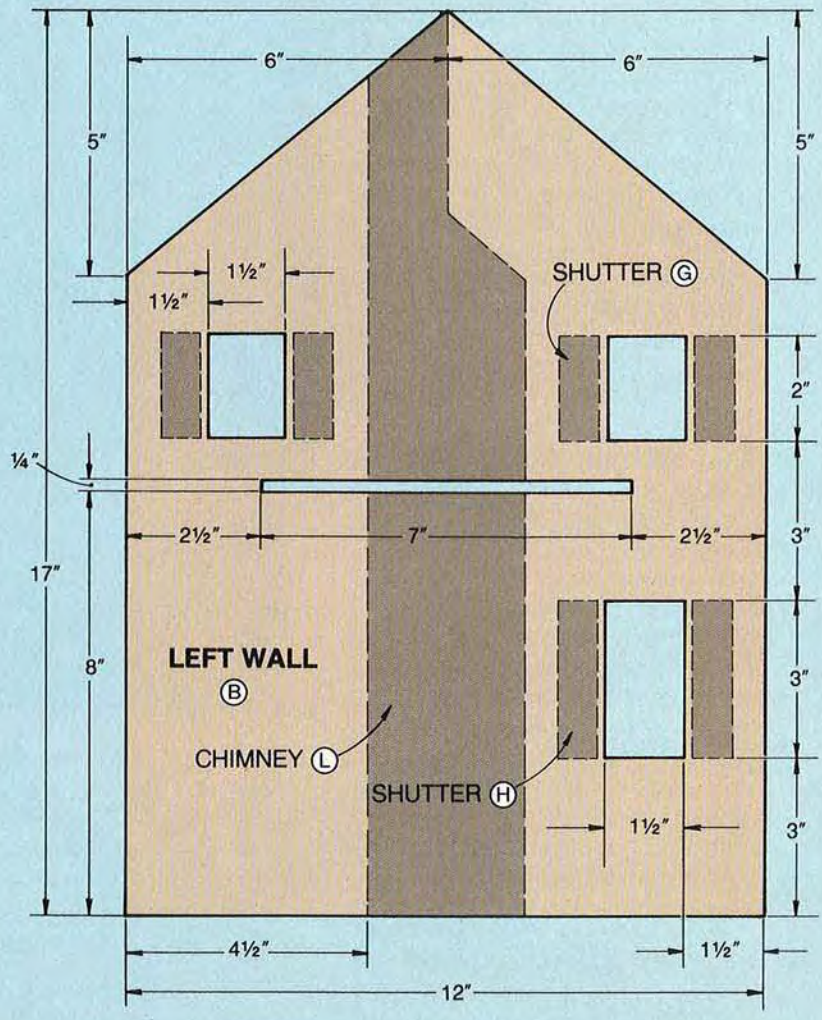
DOLLHOUSE



PARTS VIEW







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December 1988

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February 1989

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Cumulative index for issues 25-32

If you keep back issues of *WOOD*® magazine for future reference—as many of our readers do—save this index in a special spot. The index appears in the center of the magazine so you can remove it. We've tried to keep the index easy to use. For example, after the subject "Bench planes," you'll see the number 29:38-43. This means the article appears on pages 38 through 43 of issue 29. You'll find the "Project Index" on page 51 helpful in locating all the projects in these eight issues.

The index for *WOOD* issues 1-8 appeared in issue 9 (February 1986); 9-16 in issue 17 (June 1987); 17-24 in issue 25 (October 1988).

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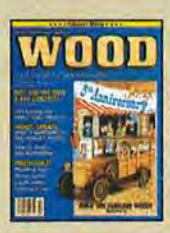

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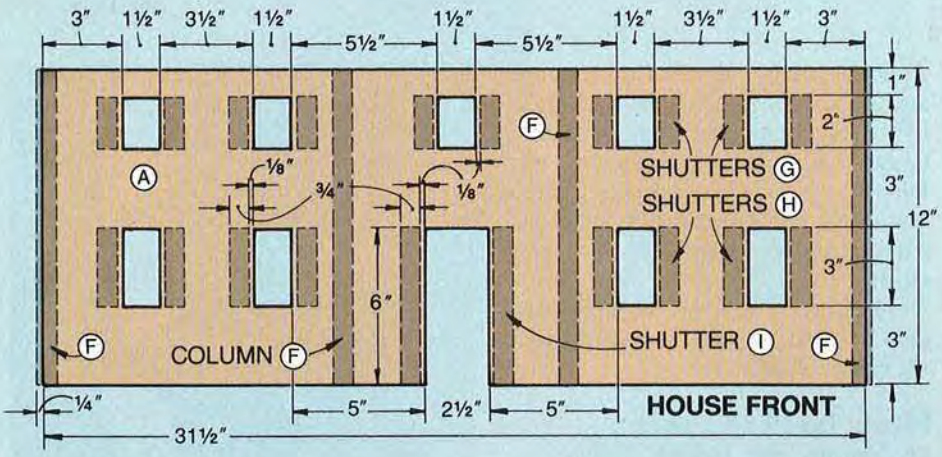
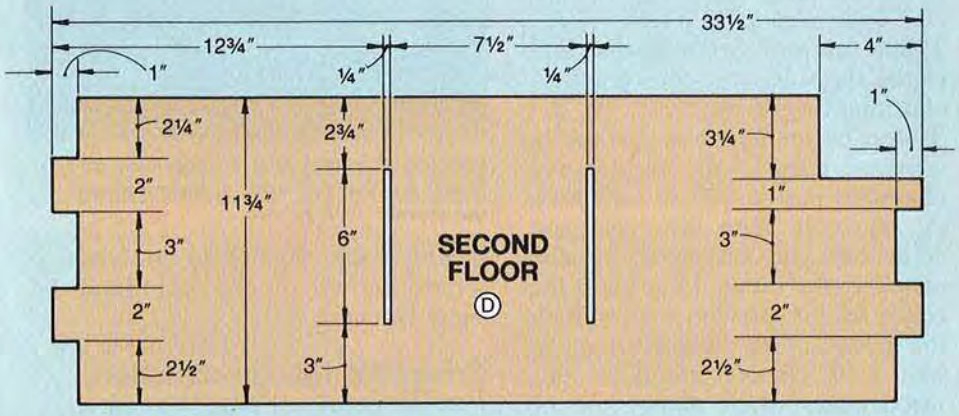
Indexer: Barbara Klein





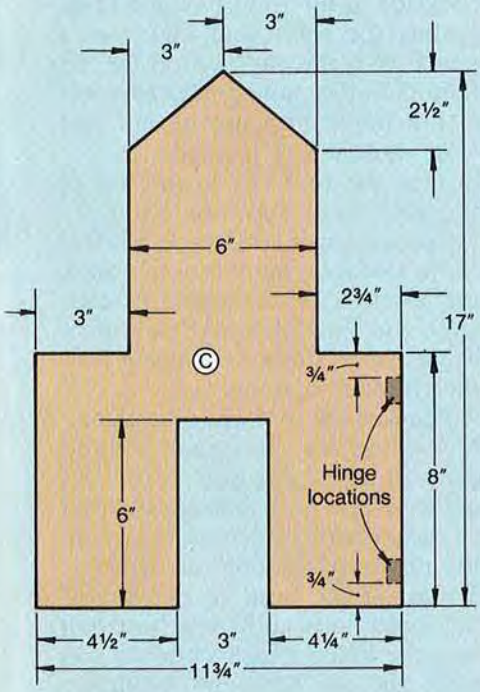
Bill of Materials

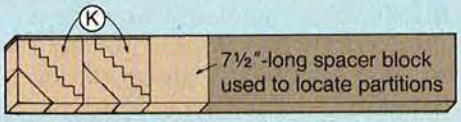
Part		Finished Size* T	W	L	Matl.	Qty.
DOLLHOUSE						
A	front	¼"	12"	31½"	BP	1
B	walls	¼"	12"	17"	BP	2
C	partitions	¼"	11¾"	17"	BP	2
D	second floor	¼"	11¾"	33½"	BP	1
E	roof	¼"	9"	33½"	BP	1
F	columns	¼"	¾"	12"	BP	4
G	shutters	¼"	¾"	2"	BP	18
H	shutters	¼"	¾"	3"	BP	12
I	door shutters	¼"	¾"	6"	BP	2
J	door	¼"	2 7/16"	5 15/16"	BP	1
K	staircase	3"	7"	7¼"	LF	1
L	chimneys	¾"	3"	18¼"	B	2
M	chimney caps	¾"	1½"	2¼"	B	2
STORAGE CASE						
N	case sides	¾"	3¼"	35½"	B	2
O	case ends	¾"	3¼"	18½"	B	2
P	case panels	¼"	20"	35½"	BP	2

Material Key: BP-birch plywood
LF-laminated fir

Supplies: quick-set epoxy, three pair of ¾×1" brass hinges (Stanley part no. CD5302), one pair of brass-plated chest latches with screws (Stanley part no. CD5365), 1 1/16×30" continuous hinge with screws (Stanley part no. SC311), #8×1" flathead wood screws, ¼×3" hex-head bolt, ¼×1" hex-head bolt, paint.

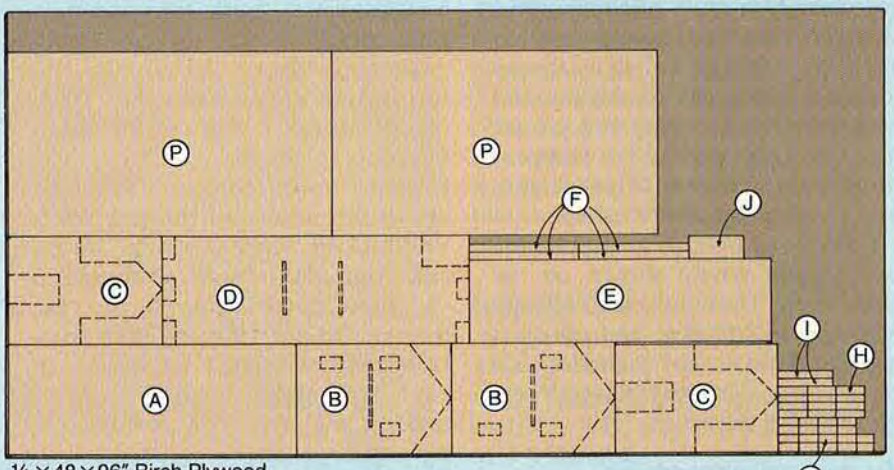
PARTITIONS



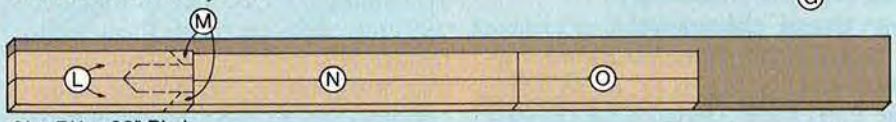


1½×7¼(2×8)×48" Fir, Pine, or Spruce

Cutting Diagram



¼×48×96" Birch Plywood



¾×7¼×96" Birch

Continued

DOLLHOUSE

2 Position the front piece (A) face down on your workbench. Place the partition/second-floor assembly on the back side of the front piece, with the ends flush where shown on the drawing on the opposite page. Make sure, too, that the bottom edges of the partitions are flush with the bottom edge of the front piece. Cut a spacer to length, and clamp it between the partitions where shown in the drawing. (The spacer helps keep the partitions square to the front piece.) Check that the partitions are square with the front piece, and then tape the partitions to the spacer.

3 Discard the screws packaged with the ¾×1″ brass hinges. Then, epoxy the hinges to the front piece. (We used quick-set epoxy, and lightly sanded the hinge surfaces for better adhesion to the epoxy.) Later, epoxy the other leaf of each hinge to the partitions.

4 Repeat the process in Step 3 *above* to epoxy the front-door hinges to the front piece (A) and the door (J).

Two steps make a staircase

1 Cut two pieces of 2×8 to 7″ wide by 7¼″ long. (When cutting the pieces to width, we ripped both edges of the 2×8 to get rid of the rounded-off corners of the board.) Glue and clamp the pieces together face to face for the staircase lamination (K). Using the dimensions on the Parts View Drawing and a combination square, mark the steps on the 2×8 lamination. With a bandsaw, cut the staircase to shape.

2 Drill a ¼″ hole ½″ deep in the stair bottom where shown on the Parts View Drawing. Cut off the head of a ¼×1″ bolt, and epoxy it into the hole in the staircase. See the staircase on the Parts View Drawing for reference.

No mason necessary for these chimneys!

1 Transfer the dimensions for the chimneys (L, M) to ¾″ birch. (See the Parts View Drawing for dimensions.) Cut each chimney to shape.

2 Draw diagonals to find center, and then drill a 5/16″ hole 3¼″ deep in the top center of each chimney. (Again, see the chimney on the Parts View Drawing for reference.) Mark the angled cutlines, and cut each chimney cap (M) from the chimney (L).

3 Glue one chimney to each wall (B) where shown on the Parts View Drawing.

Next, build the case to house the home

1 Cut the case sides (N) and ends (O) to size from ¾″ birch stock.

2 With the surfaces flush, glue and clamp the sides and ends together, checking for square.

3 Measure the length and width of the case frame, and cut the two case side panels (P) to size from ¼″ plywood. With the edges and ends flush, glue and clamp the side panels to the frame. Later, sand the edges of the plywood flush with the edges of the frame. Rout or sand a ¼″ chamfer along the plywood edges where shown on the Exploded-View Drawing.

4 Drill screw holes and strengthen the joints with #8×1″ flathead wood screws where shown on the Exploded-View Drawing. Plug the holes and sand the plugs flush.

5 Locate and mark the chimney-hole locations onto the plywood-case top where shown on the Exploded-View Drawing. Drill blade-start holes, and cut the chimney slots to shape.

6 Raise your tablesaw blade ⅞″ above the surface of the saw table. Position the fence 2″ from the inside edge of the blade. As shown in the photo *above right,* cut the case in two. (To keep the saw kerfs from collapsing, we taped ⅛″ spacers in each kerf after cutting it.) After making the final cut, remove the tape and spacers.

7 Position the case halves together with the edges and ends flush. Center the 1 1/16×30″ continuous hinge over the joint line along one edge, centered from side to side, and screw it in place.

Position the tablesaw fence, raise the blade, and cut one edge at a time to saw the storage case in two.

8 Attach the latches to the case where shown on the Exploded-View Drawing.

Complete the construction

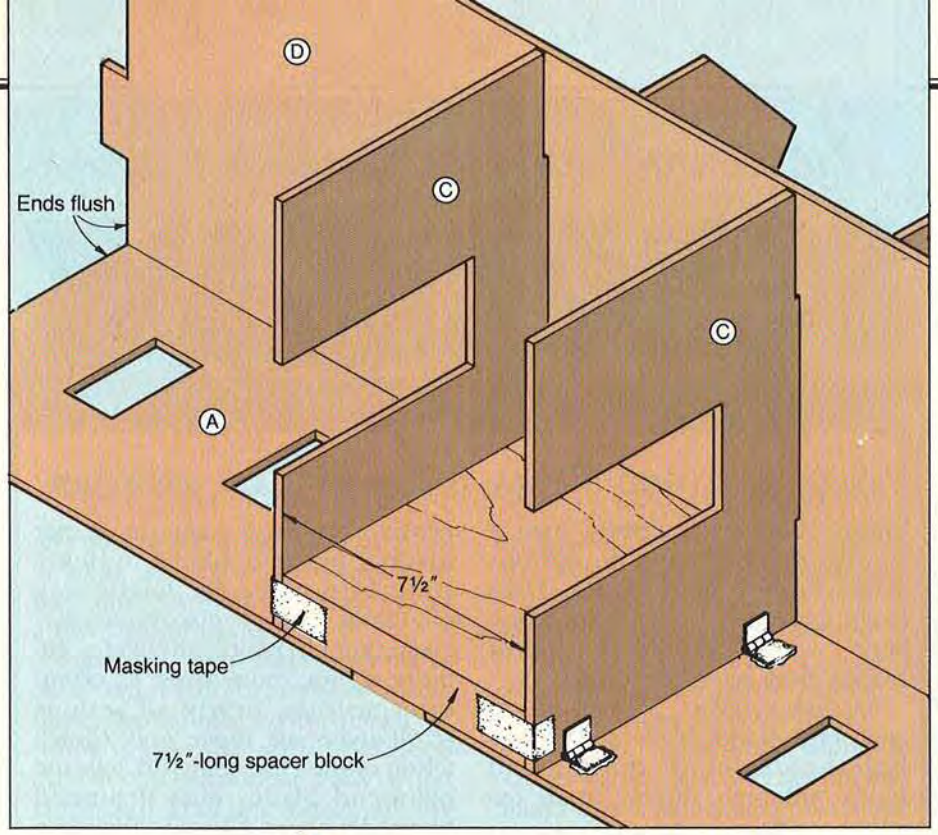
1 Fit the dollhouse onto the case so the chimneys slip into the chimney holes in the case panel (P).

2 Position the staircase against the backside of the front (A) and flush against the right wall (B). Use a pencil to mark the location for the bolt-mounting hole on the case top (P). Remove the staircase, and drill a 5/16″ hole where marked.

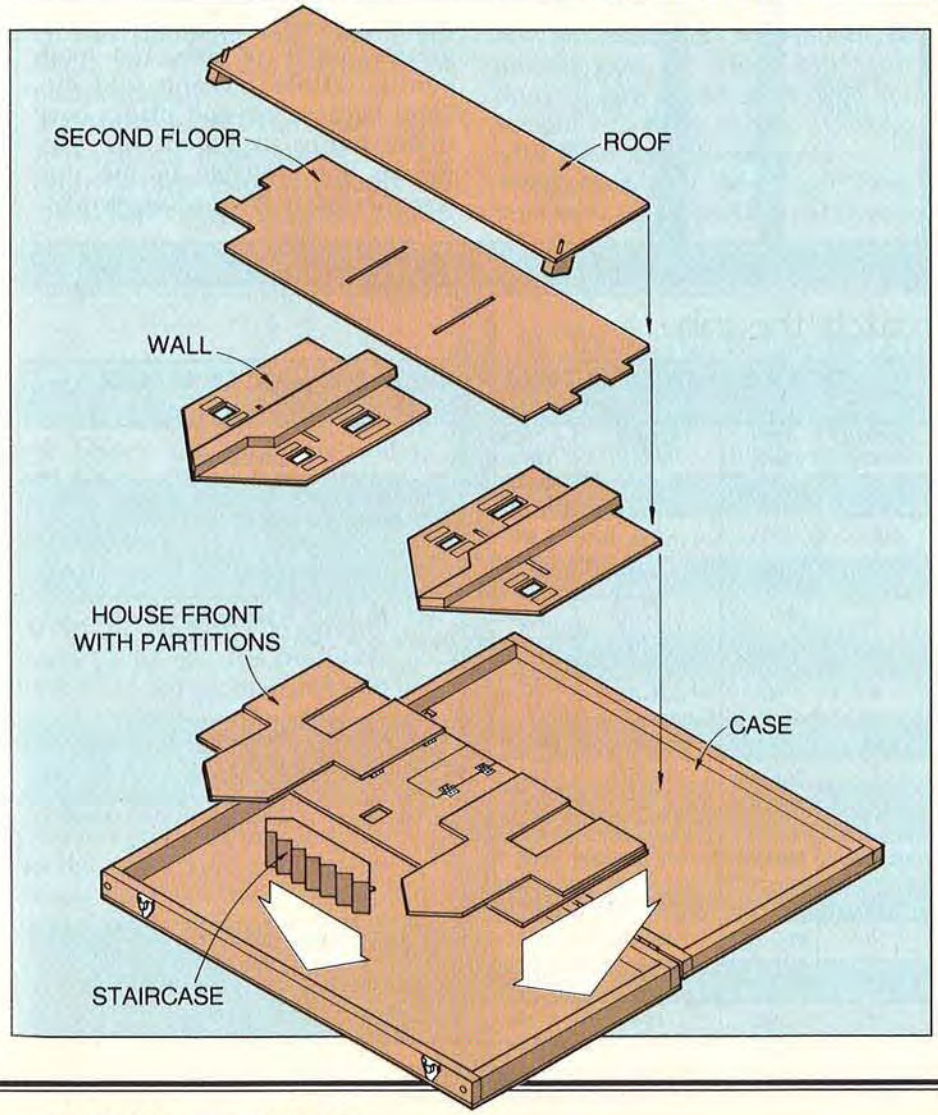
3 Tape the roof (E) to the top of the end walls (see the Chimney Detail accompanying the Exploded-View Drawing for location). Mark the location of the chimney caps (M), and then glue and tape them to the top of the roof squarely over the chimney bottoms (L).

4 Remove the roof from the assembly. Using the previously drilled hole in each chimney cap as a guide, drill a hole through the roof at each chimney cap as shown in the photo on the opposite page.

5 Cut off the head of two ¼×3″ hex head bolts, and epoxy one bolt into the hole in each chimney cap (M). See the Chimney Detail accompanying the Exploded-View



Using the previously drilled hole in the chimney cap as a guide, drill a ¼" hole through the roof.



Drawing for reference. (We found that using a bolt is much stronger than a dowel, which has a tendency to break with heavy use.)

Call the house painters

1 Sand the parts and remove the latches and continuous hinge.

2 Paint the pieces with semigloss enamel. (For our house and case, we applied Rust-Oleum Wood Saver paints. After the first coat dried, we brushed the end grain with an extra coat. After that dried, we repainted all the surfaces.)

3 Now, add the trim lines on the chimney (we used a medium-point felt-tipped marker for this).

4 Attach the hardware. To store the pieces inside the carrying case, see the drawing at *left*.

Buying Guide

- **Dollhouse furniture plans.** $12.49 (U.S.) ppd. for plan no. W511 from Meisel Hardware Specialties, P.O. Box 70W4, Mound, MN 55364.

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Project Design: Dave Ashe; James R. Downing
Photographs: Hopkins Associates; Jim Kascoutas
Illustrations: Kim Downing; Bill Zaun

Print this article

The woodworker's survival SCROLLSAW

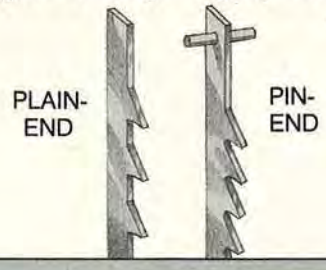
A few months ago, I bought a new scrollsaw. And, a couple of weeks later I had exhausted the supply of blades provided with the saw. Instead of just spending a few bucks at the local hardware store for the brand carried there, I did some research into the topic. Let me tell you, poking my nose into the scrollsaw-blade business provided me with a real education. Read on and I'll fill you in.

Bill Krier
Products/Techniques Editor

Pin- or plain-end blades: It depends on your saw

Those of us who already own a scrollsaw really have no options when buying new blades. Most saws generally accept only one type—either pin- or plain-end blades. Both have advantages.

As shown *below,* a small pin at each end of the blade serves as a holding device in the pin-end types. Although slightly more expensive (about 7 cents more per blade), pin-end blades quickly slide into place for hassle-free mounting. But, I discovered that even though plain-end blades require a little more work to clamp into position, nearly all serious scrollsawers use them. And, Chuck Olson of the Olson Saw Co. tells me plain-end blades outsell pinned blades by about 20 to 1. "You can buy plain-end blades in a much greater variety of sizes and tooth configurations," Olson told me. "And because pin-end blades have to be wider to accept the pin, they're not available in the thin sizes necessary for intricate work."



Choose a coarseness to match the job

Ron King, who travels the country demonstrating scrollsaws for Advancery Machinery Imports (AMI), has plenty of advice on buying scrollsaw blades. Of all the pearls of wisdom he passed on to me, this one really cut to the core of the matter: "Select the coarsest blade that gives a cut that's satisfactorily smooth for your job." Coarse blades, because of their extra width, help you cut a straighter line. Fine blades, on the other hand, cut more smoothly than coarse ones, but they also cut slower and break more often. So, it pays to test coarser blades first, then turn to finer blades as you look for the ideal type for your project.

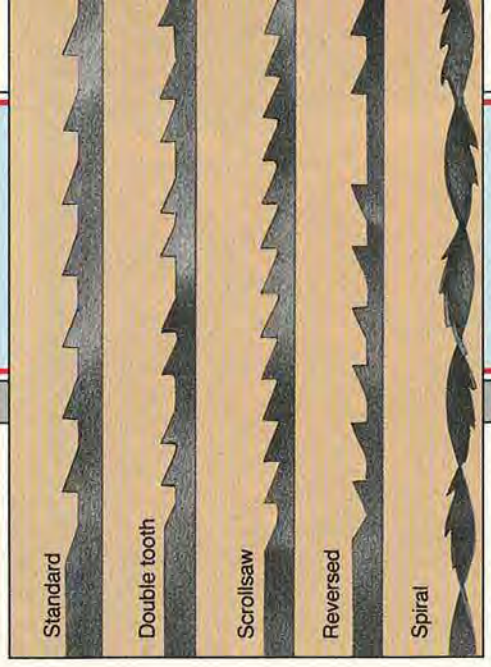
As you can see by looking at the chart at *right,* plain-end blades have universal numbers, with the high-numbered blades being the

CHOICES, CHOICES: CUTTING THROUGH THE MAZE OF BLADES
(standard, skip-tooth, plain-end blades listed)

UNIVERSAL NUMBER	WIDTH (inch)	THICKNESS (inch)	TEETH PER INCH	APPLICATIONS
2/0	.015–.022	.010	28–30	Extremely intricate sawing in veneers, plastics, hard rubber, and pearl up to 3/32" thick
0	.024	.011	25	
1	.026	.011–.012	23–25	
2	.028–.029	.012–.013	20–23	Tight radius work in hardwoods to ½" thick, softwoods to ¾", and plastics to ¼"
3	.032	.013–.014	18–20	
4	.035	.014–.015	15–18	
5	.038–.039	.015–.016	12½–16½	Tight radius work in hardwoods to ¾", softwoods to 1", and plastics to ½"
6	.041–.043	.016–.017	12½–15	
7	.045	.017–.018	11½–14	Hardwoods to 1", softwoods to 1½", plastics to ½"
8	.047–.049	.017–.018	11½–14	
9	.053	.018–.019	11½–14	
10	.056–.057	.019–.020	11–12½	Hardwoods to 1½", softwoods to 2", plastics to ¾"
11	.059–.063	.019–.020	9½–12½	
12	.062	.024	9½	

guide to buying...

BLADES



What you need to know about tooth patterns

As you can see from the illustration at *right,* scrollsaw blades come in five different tooth patterns. Here's a few tips on each:

- **Standard.** Sometimes referred to as a skip-tooth or fretsaw blade, these kerf-cutters easily outsell all other types. The gullet between each tooth helps clear away wood chips and cool the blade. In my hands-on testing, this blade cut faster and smoother than any other blade in ¾" stock. Available in plain-end only.
- **Double tooth.** Currently, only AMI imports these blades, but because of their rising popularity the Olson Saw Company is also considering manufacturing them. "These are AMI's hottest-selling blades," Ron said. In the *WOOD*® magazine shop, double tooth blades produced less chip-out than the other blades in materials less than ⅛" thick.
- **Scrollsaw.** Most often found in coarser sizes, especially in pin-end blades, these stiff blades work best in rigid-arm scrollsaws. Although not recommended for smooth or intricate cuts, the wide (.250") versions of this blade work well for straight cuts such as rips. Available with plain and pinned ends.
- **Reversed.** This new blade from the Olson Saw Company has five or six teeth at the bottom of the blade that point upward. Why? The reversed teeth reduce splintering on the bottomside of the workpiece. Available in only a few coarser sizes of plain-end blades.
- **Spiral.** These twisted scrollsaw blades leave a wide kerf. But, because they cut in all directions you don't have to rotate the workpiece for curved cuts. And, they work well for bevel cuts. Plain-end only.

coarsest. Various suppliers assign different model numbers to pin-type blades, but the same width, thickness, and teeth-per-inch guidelines apply to choosing the right pinned blade.

What blades do the pros use? To find out, I asked Gene Douglas, co-owner of Marlow Woodcuts in Americus, Kansas. His family operation cranks out more than 5,000 intricately scrollsawed pieces every year, and goes through more than 2,000 blades in the process. Gene wouldn't reveal his source, as he considers that a trade secret, but he did tell me what *type* of blade he favors. For 1/16" walnut plywood with a poplar center, the Marlow scrollsawers clamp no. 2/0 scrollsaw blades into their machines, and use no. 5 standard blades when sawing 9/16" solid walnut.

A few more blade-buying guidelines

- For metal cutting, buy a jewelers blade. Available in up to 20 universal sizes, these plain-end, hardened blades have the same tooth pattern as scrollsaw blades.
- If you plan to buy a scrollsaw, keep in mind that you'll find the widest array of blades in the 5" length. Although the majority of saws accept this size, some "hobby" machines take 2¾" blades.
- Don't forget that the quality of your scrollsaw may have a bearing on your blade purchase. As Ron King told me, "If I'm using a less-expensive Sears or other Taiwanese-made saw, to avoid breakage I have to buy a thicker and wider blade than if I'm working with a Delta, RBI, Hegner, or other high-quality saw."
- And yes, it's nearly impossible to tell one size scrollsaw blade from another. So, you need a storage system such as the one we designed (see page 80).

For more information and catalogs

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Written by Bill Krier Illustrations by Jim Stevenson Photograph by Bob Calmer

Swing into spring with this **PETAL-POWERED**

Hang around a blooming garden long enough and you're sure to be mesmerized by the beating of a hummingbird's wings and the darting of its slender body from flower to flower. Now, you can savor that image year-round with our brightly colored wall plaque crafted on the scrollsaw. And, for a depth effect, we've rounded the front edges of the pieces.

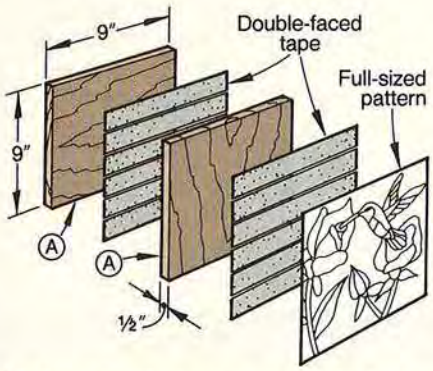
***Note:** If you'd like, we'll send you (absolutely free) three full-sized patterns needed for this project. (See the end of the article for ordering information.) Or, if you just can't wait to get started, enlarge the gridded pattern and make two photocopies of it.*

For more helpful information, see our tips on buying scrollsaw blades on page 56.

Print this article

Prepare the stock for scrollsawing

1 Cut two pieces of flat ½"-thick pine to 9" square. (To achieve the grain on the flower and bird running in one direction and the grain of the background pieces going in the opposite direction, you'll start with two boards and end up with enough pieces for *two* projects.)



2 Completely cover one face of one of the pieces with double-faced tape (also called carpet tape). With the edges and ends flush, stick the two pieces together, with the grain of one of the pieces perpendicular to that of the other where shown on the drawing *above.*

3 To enlarge the gridded pattern shown on the opposite page, draw a 1" grid measuring 9×9" on a piece of paper. Using the grid pattern as a guide, lay out the shape of the flowers and hummingbird onto the gridded paper. To do this, mark the points where the pattern outline crosses each grid line. Draw lines to connect the points. You'll need three patterns for this project, so either trace two more patterns from the first, or photocopy the first pattern twice.

4 Now, using double-faced tape, adhere one of the full-sized patterns to the face of the top piece.

Scrollsaw and sand the parts to shape

1 To minimize splintering and to prevent small pieces from becoming lodged between the blade and the metal table, add a zero-clearance top to your scrollsaw. (To do this, we cut a piece of ¼" plywood to 13×13". Then, we drilled a ⅛" blade hole through the middle of the plywood and adhered the plywood to the metal scrollsaw top with double-faced tape.)

2 Scrollsaw the flower and hummingbird patterns to shape. After you cut each piece, separate the two pine sections, remove the double-faced tape, and mark an X on the *back* side of each. This will come in handy later when sanding the round-overs in the next step.

3 Sand a slight round-over along the *front* edges of each piece—remember, the back side has an X on it. The round-overs add a professional three-dimensional appearance. (To sand the round-overs, we formed a drill clamp out of a scrap 2×4 and 4" carriage bolt, and held it in a woodworker's vise as shown *below.*) You also can hand-sand the round-overs with a palm sander or mount a flexible-sanding disc or drum sander to your drill press.

Sand slight round-overs on the front face of each pattern piece.

scrollsaw sculpture
WALL HANGING

Beauty blooms when you paint and adhere the pieces

1 Cut the back (B) to size from ½" plywood. Apply a thin, even coat of woodworker's glue to the face side of the plywood; then, stick a full-sized pattern to the back (B).

2 Remove the double-faced tape and/or the pattern from the front of the sanded pieces. In a well-ventilated area, dampen a cloth with lacquer thinner, and clean each piece (the double-faced tape tends to leave a sticky residue).

3 Group all the green pieces together and paint them. (We used fast-dry enamel spray paint. To allow the grain to show through slightly, we sprayed on the first coat of paint and immediately wiped off most of it with a clean cloth. Later, we applied a light second coat without wiping it off.) Repeat for the red, brown, and white pieces.

4 Use woodworker's glue to adhere the pieces, one at a time, to the paper pattern glued to the ½" plywood as shown *below.*

Apply glue to the pattern pieces, and adhere them to the backing board.

5 After gluing all the pieces in place, check for 90° corners. Trim as necessary.

Add the frame, and apply the finish

1 Cut two pieces of ½" pine to 1¼" wide by 22" long for the frame pieces (C). Rout ¼" round-overs along one edge of each.

2 Miter-cut the four frame pieces to length. Glue and clamp the frame pieces to the center portion.

3 To allow for hanging the project, drill a ¼" hole ½" deep at an upward angle on the back side of the frame where shown in the Hole Detail accompanying the Exploded-View Drawing.

4 To avoid runs, spray on several light coats of a clear finish (we used Deft, an aerosol lacquer).

FREE PATTERN OFFER

Three full-sized hummingbird-and-flower patterns.

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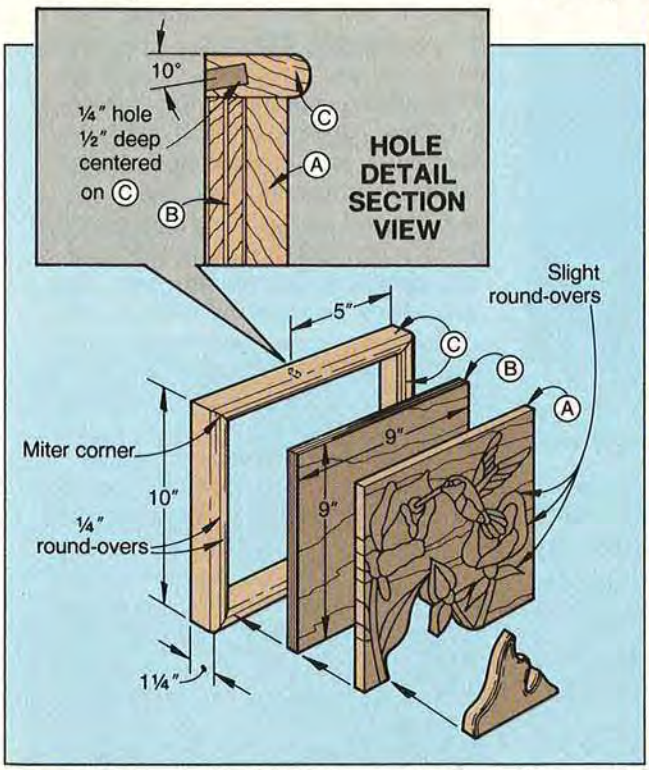


Project Design: Jeff and Leonila Girdler Photographs: Hopkins Associates; Bob Calmer Illustrations: Kim Downing; Mike Henry

Customized TABLESAW

Print this article

Note: We sized our base to fit a Sears 10" direct-drive tablesaw. The sides of the base are flush with the sides of the saw. You may have to alter the base size to fit your particular saw.

Here's a great-looking addition for your shop, with lots of advantages over run-of-the-mill tablesaw stands. The thing I think you'll appreciate most about this project is the dust-gathering performance made possible by the enclosed top compartment. But that's not the only goodie I've designed into the base. You'll also find nifty places to store your pushstick, miter gauge, rip fence, saws blades, and a wrench to change those blades. The whole project, including the hardware, costs less than $65.

Design Editor

Construction begins with the cabinet carcass

1 Rip and crosscut the two side panels (A), dividers (B), and back (C) to the sizes listed in the Bill of Materials from ¾" particleboard.

2 Cut or rout ¾" dadoes ¼" deep in each side panel for the dividers to fit into. See the Exploded-View Drawing on page 62 for location. Cut a ¾" rabbet ¼" deep along the back edge of each side panel.

3 Measure the outside diameter of your vacuum hose (we measured ours at 2½" with an outside calipers). Using a compass, center and mark the hole location to the back (C) where shown on the Exploded-View Drawing. Drill a blade-start hole, and cut the hole to size with a circle cutter or jigsaw.

4 Glue and clamp the dividers and back piece between the side panels, checking for square. After the glue dries, remove the clamps, and

For safe cutting later, make a pushstick

1 Cut a piece of heavy paper to 4×13", and draw a 1" grid on it. Using the grid pattern at *right* for reference, lay out the pushstick shape on the gridded paper. To do this, mark the points where the pattern outline crosses each grid line. Next, draw lines to connect the points. Mark the centerpoints for the two ¾" holes.

2 Cut the paper pattern to shape, and use it as a template to transfer

BASE

sand the joints. Rout a ¼" roundover along the edges of the base where shown on the Exploded-View Drawing.

Attach the trim, and mount the cleats and access panel

1 Cut the baseboard parts (D, E) to size plus 2" in length. (We chose birch; you also could use good-quality 2×6 material.) Bevel-rip a 1¼" chamfer along the top outside edge and a ¼" chamfer along the bottom outside edge of each piece. Miter-cut the pieces to length, and glue and clamp them flush with the bottom of the cabinet.

2 Cut the mounting cleats (F) to size, drill mounting holes through the side panels, and screw the cleats flush with the top edge of the cabinet sides where shown on the Exploded-View Drawing.

3 Cut the access panel (G) to size. Mark the location, and bore a 1" finger hole in the access panel.

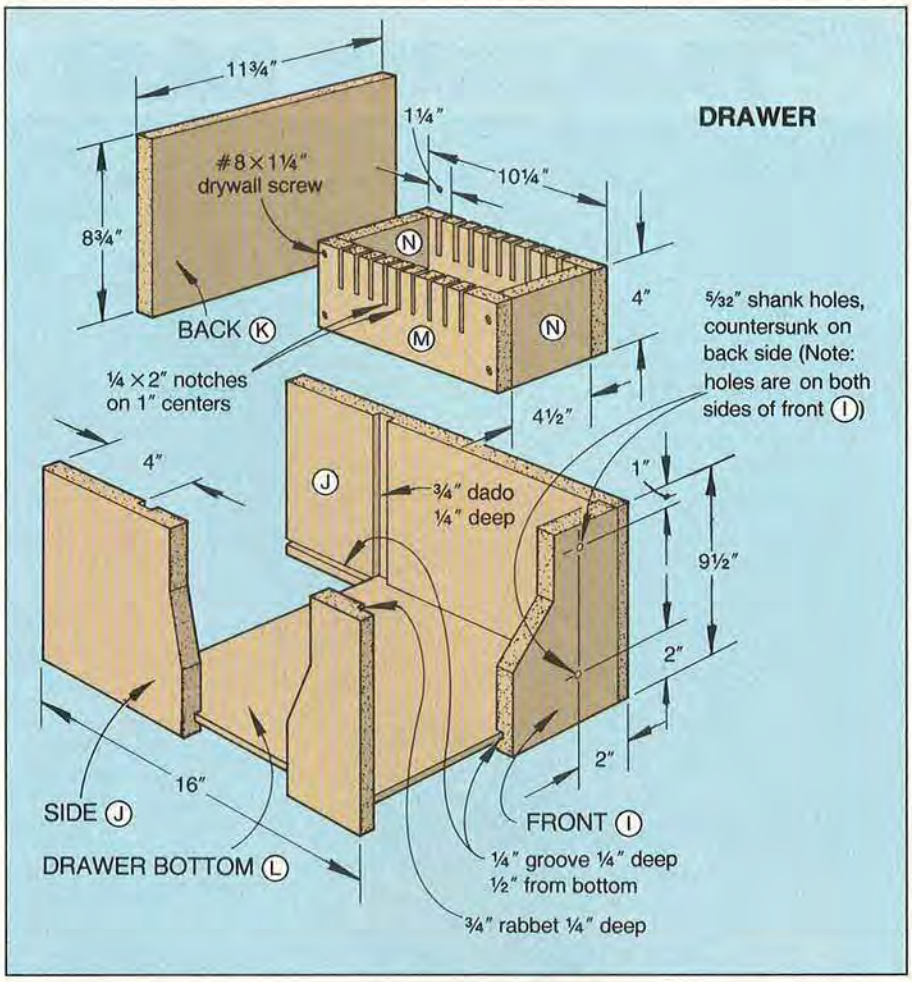
Add the drawer and blade rack

1 From ¾" particleboard, cut the drawer face (H), front (I), sides (J), and back (K) to the sizes listed in the Bill of Materials. Cut the drawer bottom (L) to size.

2 Cut or rout a ¼" groove ¼" deep ½" from the bottom edge into the drawer sides (J) and front (I) where shown on the Drawer Drawing *above*. Now, cut a ¾" dado ¼" deep 4" from the back edge in each drawer side. Next, cut or rout a ¾" rabbet ¼" deep along the front edge of each side. Dry-clamp the pieces to check the fit.

3 Glue and clamp together the drawer (I, J, K, L), checking for square. Using the Drawer Drawing for reference, mark the centerpoints, and drill four shank holes through the front (I). Countersink the holes on the back side of the drawer front. You'll use these holes later for attaching the drawer face.

4 Cut the blade rack parts (M, N) to size and cut the dadoes where shown in the drawing *above*. Assemble the rack.



Let's add the fence and miter-gauge holders

1 Cut the fence holder parts (O, P) to size. Glue and clamp O to P, with the bottom edges and ends flush. Glue and screw the fence holder to the right-hand side panel (A) where shown on the Exploded-View Drawing.

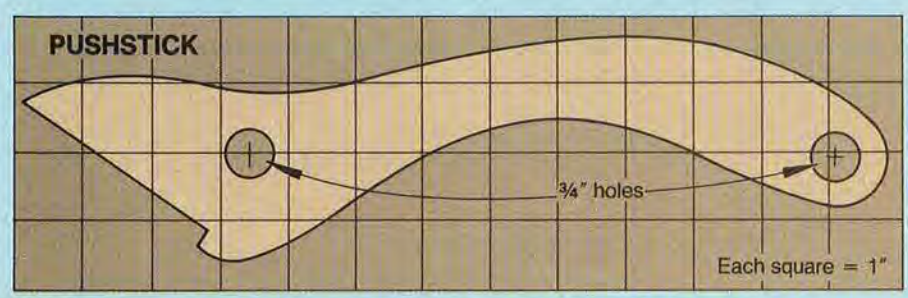
2 Cut a piece of ¾"-thick birch to 2½" wide by 12½" long for the miter-gauge holder (Q). Cut or rout a 1" groove ½" deep along the center of part Q. See the Miter Gauge Holder Drawing for location.

3 Drill six 5/32" shank holes through the holder (Q) where shown on the Miter-Gauge Holder Drawing. Set it aside; you'll attach it later.

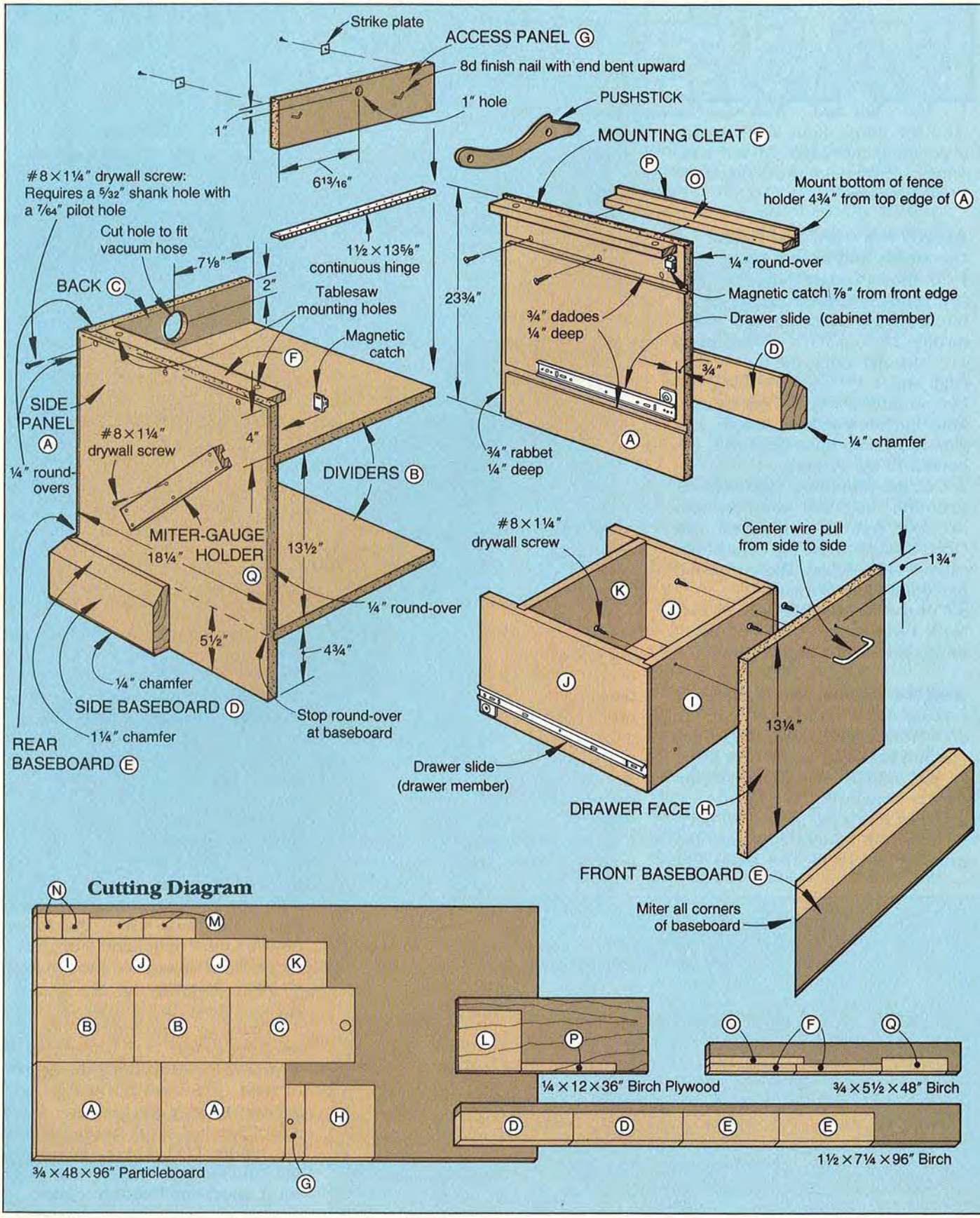
Continued

the full-sized pushstick pattern to ½" plywood. Cut the pushstick to shape. Bore two ¾" holes through the pushstick where marked.

3 Add two nails to the access panel for holding the pushstick.



Customized TABLESAW BASE



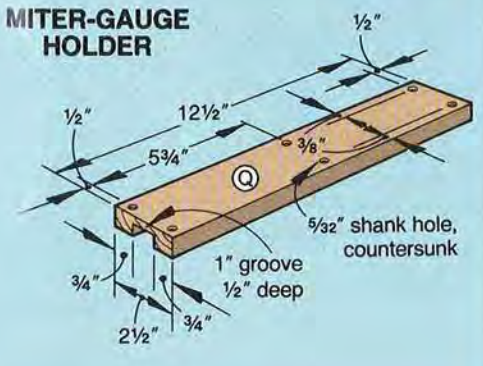
Bill of Materials

	Parts	Finished Size* T	W	L	Matl.	Qty.
	BASE CABINET					
A	sides	¾"	18¼"	23¾"	PB	2
B	dividers	¾"	14¼"	17½"	PB	2
C	back	¾"	14¼"	23¾"	PB	1
D*	side basebrd	1½"	5½"	21¼"	B	2
E*	frnt&bck basebrd	1½"	5½"	18¼"	B	2
F	cleat	¾"	1¾"	16¾"	B	2
G	panel	¾"	3¾"	13⅝"	PB	1
	DRAWER					
H	face	¾"	13¼"	13½"	PB	1
I	front	¾"	9½"	11¾"	PB	1
J	sides	¾"	9½"	16"	PB	2
K	back	¾"	8¾"	11¾"	PB	1
L	bottom	¼"	11½"	11¾"	P	1
M	sides	¾"	4"	10¼"	PB	2
N	bottom	¾"	4"	4½"	PB	2
	FENCE AND MITER-GAUGE HOLDERS					
O	bottom	¾"	1½"	17½"	B	1
P	side	¼"	1½"	17½"	P	1
Q	holder	¾"	2½"	12½"	B	1

*Initially cut parts marked with an * oversized. Then, trim them to finished size according to the how-to instructions.

Material Key: PB-particleboard, B-birch, P-plywood

Supplies: #8×1¼" drywall screws, two magnetic catches, 8d finish nails, 1½×13⅝" continuous hinge, 3" wire pull (handle), set of drawer slides (we used Knape & Vogt 16" drawer slide 1300), wood putty, sanding sealer, enamel paint.



Mount the access panel, magnetic catches, and pull

1 Cut one piece of ¾" continuous hinge to 13⅝" long. Screw the hinge to the bottom edge of the access panel (G) and to the top of the upper divider (B) so the access panel closes flush with the front of the divider and the side panels.

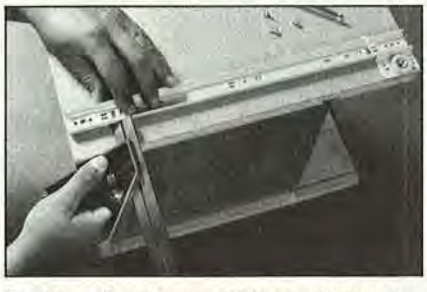
2 Fasten the magnetic catches to the side panel (A) ⅞" from the front edge. Now, close the access door and mark the mating location on the back side of the door for the strike plates. Fasten the strike plates to the back side of the access door.

3 Locate and drill the wire-pull holes through the drawer face. Attach the wire pull.

Mount the drawer slides and drawer face

1 Position the front edge of one of the drawer slides flush with the front edge of one of the drawer sides (J). Position the back bottom edge of the roller flush with the bottom edge of the drawer side. Fasten the roller end of the slide to the drawer side.

2 As shown in the photo *below*, use a combination square to keep the slide parallel with the bottom edge of the drawer, and fasten the slide to the drawer side. Repeat the procedure to fasten the other slide.



Position the drawer slide parallel to the bottom of the drawer.

3 Fasten the mating slide components to the sides (A), with the bottom edge of the slide flush with the top surface of the divider and ¾" back from the cabinet front.

4 Slide the drawer into the cabinet and adjust the slides if necessary. Place several large pieces of double-faced tape on the front face of the drawer front (I). Using ⅛" spacers, center the drawer face (H) over the drawer in the opening as shown in the photo *below*. Now, press firmly against the drawer face to adhere it to the drawer front.

5 Remove the drawer assembly from the cabinet. Fasten the drawer face to the drawer front with four #8×1¼" drywall screws using the holes previously drilled in the drawer front.

Center the drawer face in the opening, and adhere it to the drawer.

Apply the finish

1 Position your tablesaw (minus the metal base) over your new base. Trace the location of the mounting holes from the tablesaw to the cleats. With the saw still resting on the base, position the miter-gauge holder, and glue and screw it to the left-hand side panel (A).

2 Remove the saw from the base and drill the mounting holes.

3 Mask the continuous hinge, and remove the rest of the hardware from the cabinet. Finish-sand the base and drawer. Fill all exposed edges with putty and sand smooth.

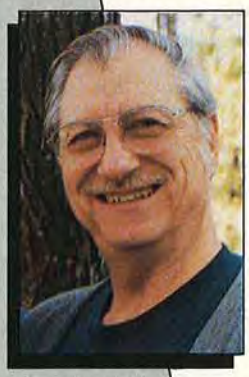
4 Apply one coat of sanding sealer to the base. Let dry, and hand-sand smooth. Repeat this process twice.

5 Spray several coats (we applied three) of an enamel paint to the base. (We took a piece of metal from our tablesaw to a paint store, and had them mix paint to match.) Fasten the tablesaw to the base.

Produced by Marlen Kemmet
Project Design: James R. Downing
Photographs: Jim Kascoutas; Hopkins Associates
Illustrations: Kim Downing; Mike Henry

THICKNESS
PLENTY OF POWER IN A

A big part of our job here at *WOOD*® magazine is listening to our readers and responding to what you say you need. So when we received a large number of letters asking our opinion about portable thickness planers, we decided to marshal our forces and get busy on this article. Our thanks to all of you readers who tipped us off about your interest in this topic. Among the many readers who wrote to us: Jim Mitchell, whose letter appears below.



Jim Mitchell

Dear WOOD:

Since your excellent review on thicknessing machines in the October 1986 issue, a new era has arrived for the home craftsman. I am speaking about all of the 10"–12" portable thickness planers that have recently flooded the market.

A short time ago, I decided to purchase a planer for my small home workshop. Thinking of the 10" Ryobi planer, I paid a visit to my local machine company and talked to salesmen and customers. I was astonished to learn that no less than eight companies now market planers in this category. With so many brands to choose from and prices spread over such a wide range, the woodworker needs to know more about these machines than just their wood capacity and price. Can you help?

James L. Mitchell
San Antonio, Texas

◀ Thanks to their light weight and relatively low price, portable planers are ideal for on-the-go woodworkers, as well as for those who don't want to spend a lot of money on a planer. Does that sound like you?

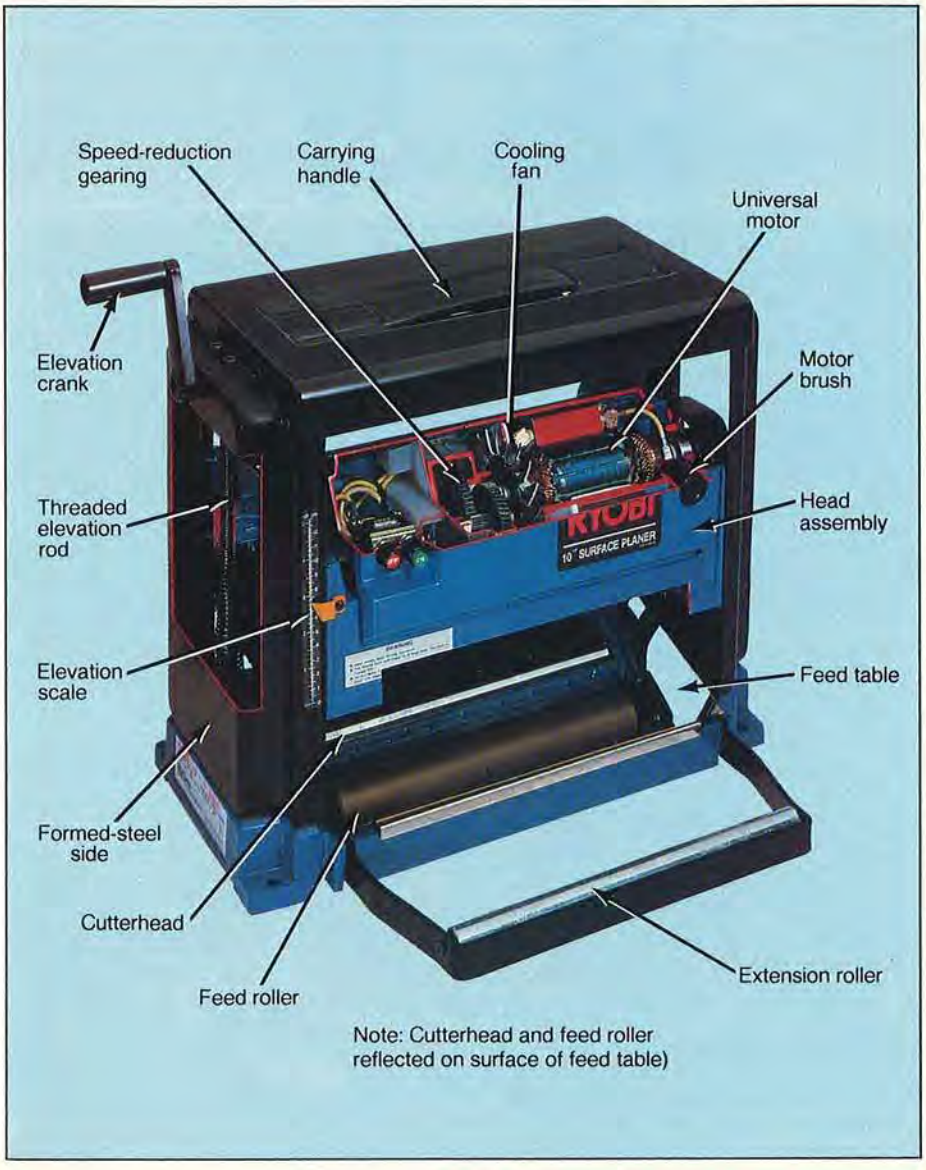
Print this article

PLANERS UNDER $500

PINT-SIZED PACKAGE

Until about five years ago, a thickness planer probably was beyond the budget of readers such as Jim Mitchell (see his letter at *left*) and maybe you, too. After all, the lowest-priced models ran close to $1,000. Then, along came Ryobi's AP-10 portable thicknesser, which sold for about $350 and planed boards up to 10" wide. Suddenly, at-home thickness planing became affordable.

Today, as the photo on page 66 attests, Ryobi faces several competitors offering machines that plane 12"-wide boards. The newest kid on the block, Makita's model 2012, sells for approximately $499. For $150 less, you can buy a Sears model 23381 that handles a 12"-wide board in two passes. And, no fewer than six importers sell Taiwanese-made clones for prices ranging from $330 to $370.



Note: Cutterhead and feed roller reflected on surface of feed table)

The nuts and bolts of a thickness planer

Before we get into the thick and thin of what makes these machines different from one another, it helps to know what makes them different from their more-expensive big brothers. As you can see by looking at the cutaway photo at *left* of the Ryobi AP-10, a **universal motor** takes the place of the heavier-duty induction motors found on most larger machines. Although induction motors generally provide greater power and reliability at lower noise levels, all of the machines we tested had enough power to plane even the hardest of woods. And, provided you change the **motor brushes** when necessary, the universal motors will perform well for you for many years.

Unlike larger thicknessers, none of the portable machines in our test performed well when we asked them to remove more than 1/32" of stock in one pass. (Larger machines gobble up to 1/4" in one pass.) Although it takes a little longer to get the job done with a portable unit, that shouldn't matter to most home woodworkers. Besides, shallow cuts make for smoother surfaces.

To adjust the depth of cut, you turn the **elevation crank** to raise or lower the head assembly. Makita's 2012—the one exception—has a stationary head and elevating table. However, we didn't find any performance differences in these two styles. Except for Sears' open-sided model, all of the units have two **formed-steel sides** to support the head assembly. These walls provided adequate support for the two-sided machines, but we detected excessive head flex in the single-side-support engineering of the Sears unit. This inherent flex made it difficult to adjust the cutterhead parallel to the table. The result: uneven stock removal.

Continued

THICKNESS PLANERS

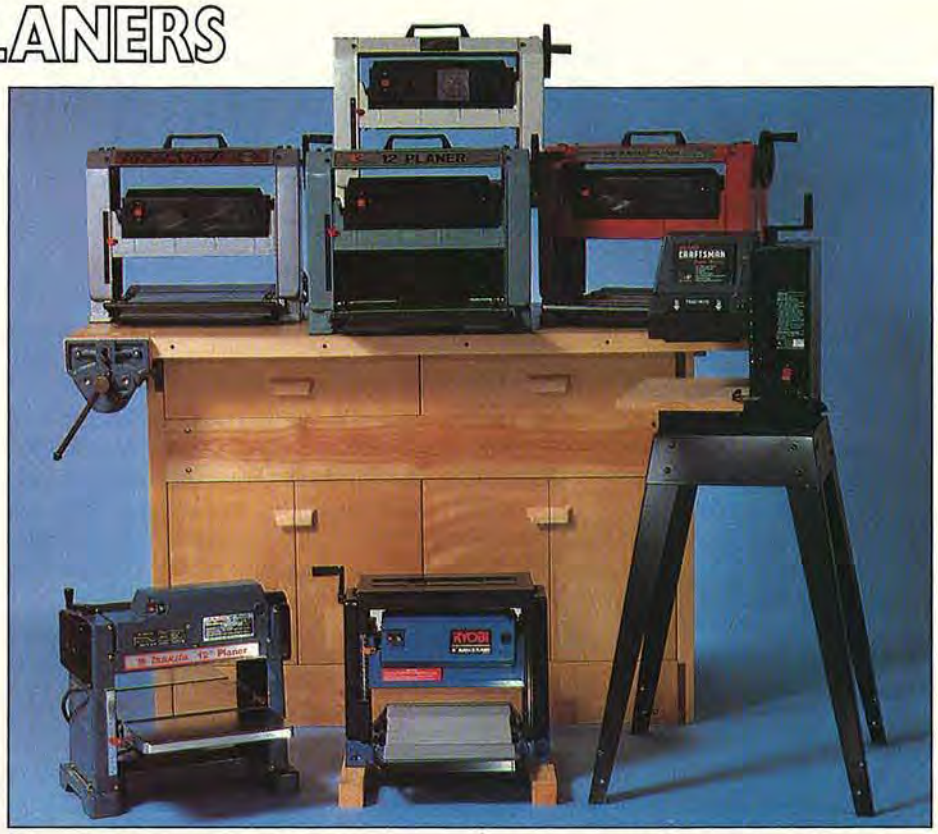
Feed tables: We prefer slip plates

The feed table on a thickness planer must provide a smooth, flat surface for the stock to ride over. We pulled out the report cards and assigned each machine a grade.

A-minus: Makita 2012 and Ryobi AP-10. Both of these machines have stainless-steel slip plates that make for flat, smooth, nonmarring feed tables. We assigned a "minus" to this grade only because you need to occasionally check for sawdust buildup under the slip plate.

B: Sears 23381. This combination thicknesser/molder has a particleboard surface that provides a flat, but nondurable surface. Why particleboard? During some molding setups, the machine's knives cut into the feed table.

C: Taiwanese-made units. These thicknessers have two steel rollers jutting above the cast-aluminum feed table. We found it a pain to adjust the rollers because they must align exactly while barely clearing the table.



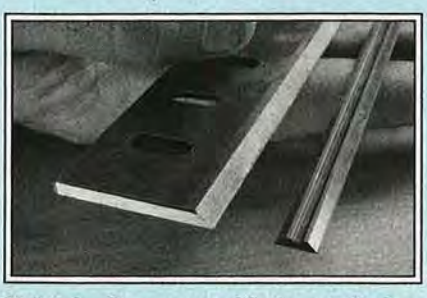
We tested these portable thicknessers: front row from left: Makita 2012 (capable of a 12"-wide cut), Ryobi AP-10 (10" capacity), and Sears 23381 (12" capacity in two passes); and four nearly identical Taiwanese-made 12" thickness planers on the benchtop from left: Total Shop, Transpower, Jet (at *top*), and Penn State.

Blade changes: How we grade the machines

Like you, we would rather use our woodworking machines than spend a lot of time adjusting and maintaining them. So, when the time comes for routine chores such as sharpening and adjusting planer knives, we opt for the easiest method possible. We put all the machines through a knife-changing test, and once again came up with performance grades:

A-plus: Makita 2012. We can't imagine any way for Makita to improve the already super-simple blade-changing system on its model 2012. First of all, this planer's throwaway knives (list price: $34 per set) mean you never have to run out for resharpening, which costs about $8–$10 per knife set. As shown *below*, each blade has two edges, so when one dulls, you just turn around the blade and reinsert it. And, thanks to a milled slot down the length of the blade, the razor-sharp edges self-align whenever you insert the blade into the cutterhead. To help you accomplish this, Makita provides magnets (see photo *below*) that keep together the blade and its holder during insertion.

A: Ryobi AP-10. If you would rather save a little money by having your blades sharpened, the Ryobi machine makes blade changes relatively simple. The AP-10 comes equipped with the plastic jig shown *below*. It automatically



Makita's throwaway blade, *right*, has two edges versus the one resharpenable edge on Ryobi's blade.

Two magnets safely hold together Makita's blade and holder for attachment to the cutterhead.

A plastic jig and Phillips screwdriver make easy work of aligning Ryobi's blade and holder.

A last-minute addition from Foley-Belsaw

After we tested the machines in this story, Foley-Belsaw introduced a new planer, much like the unit they make for Sears that's listed in the chart *below.* The Foley-Belsaw planer, shown at *right,* differs from the Sears machine in that it has a carrying handle and an extra set of knives, but no stand. Selling price for the model 455: $399.95.

PERTINENT POINTS ABOUT PINT-SIZED PLANERS

Manufacturer/ Importer	Model	Capacity: Width (inches)	Capacity: Thickness (inches)	Amps	Volts	Speeds	Feed rate (Feet per min.)	Cuts per inch	Molding (Y/N)	Accessories: Standard	Accessories: Optional	Cutterhead material	Weight	Country of origin	Selling price
Makita	2012	12	6	12	110	1	26	51	N	Extensions, blade wrench	Dust hood, stand	Aluminum	53	Japan	499
Ryobi	AP-10	10	5	13	110	1	26	51	N	Extensions, blade-adjustment gauge, blade wrench	Dust hood, carbide knives, stand	Steel	58	Japan	350
Sears	23381	12**	4¼	12.6	110	1	20	58	Y	Stand	Molding knives	Steel	76	USA	359
Various*	—	12	6	16	110	1	26	51	N	Extension, blade-adjustment gauge, blade wrench	Dust hood, stand	Steel	65	Taiwan	350

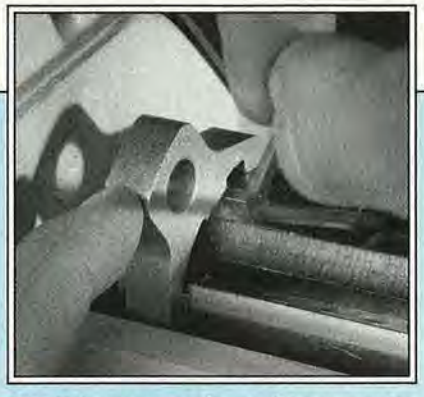
*Similar machines imported by AMT, Jet, Lobo, Penn State, Total Shop, Transpower, and Wilke Machinery

**Open throat allows 6" knives to plane 12" board in two cuts

Blade changes on the Sears 23381 proved to be a cumbersome task.

aligns the blade to its holder. Once aligned, you only need to bolt this assembly onto the cutterhead. A set of these blades lists for $51.

B-minus: Sears 23381. Sears' thicknesser/molder uses self-aligning, throwaway blades, but blade changes were an awkward experience. As demonstrated *above,* you must raise the head assembly fully, then get on your knees and work a wrench into the tight spaces underneath the head. A set of new knives costs $13.



The Taiwanese-made machines require you to work two hands into a tight area to change blades. One hand holds a blade-adjustment gauge while the other turns the blade jack screws.

C-minus: Taiwanese-made units. These machines accept standard ⅛"-thick, 1"-wide tool-steel knives, but require more adjustment time. As shown *above,* you hold a depth gauge with one hand while using the other to turn jack screws with an allen wrench. Most full-sized thicknessers and jointers employ a similar system, but offer considerably more room for your hands and tools. A new set of knives costs in the area of $20.

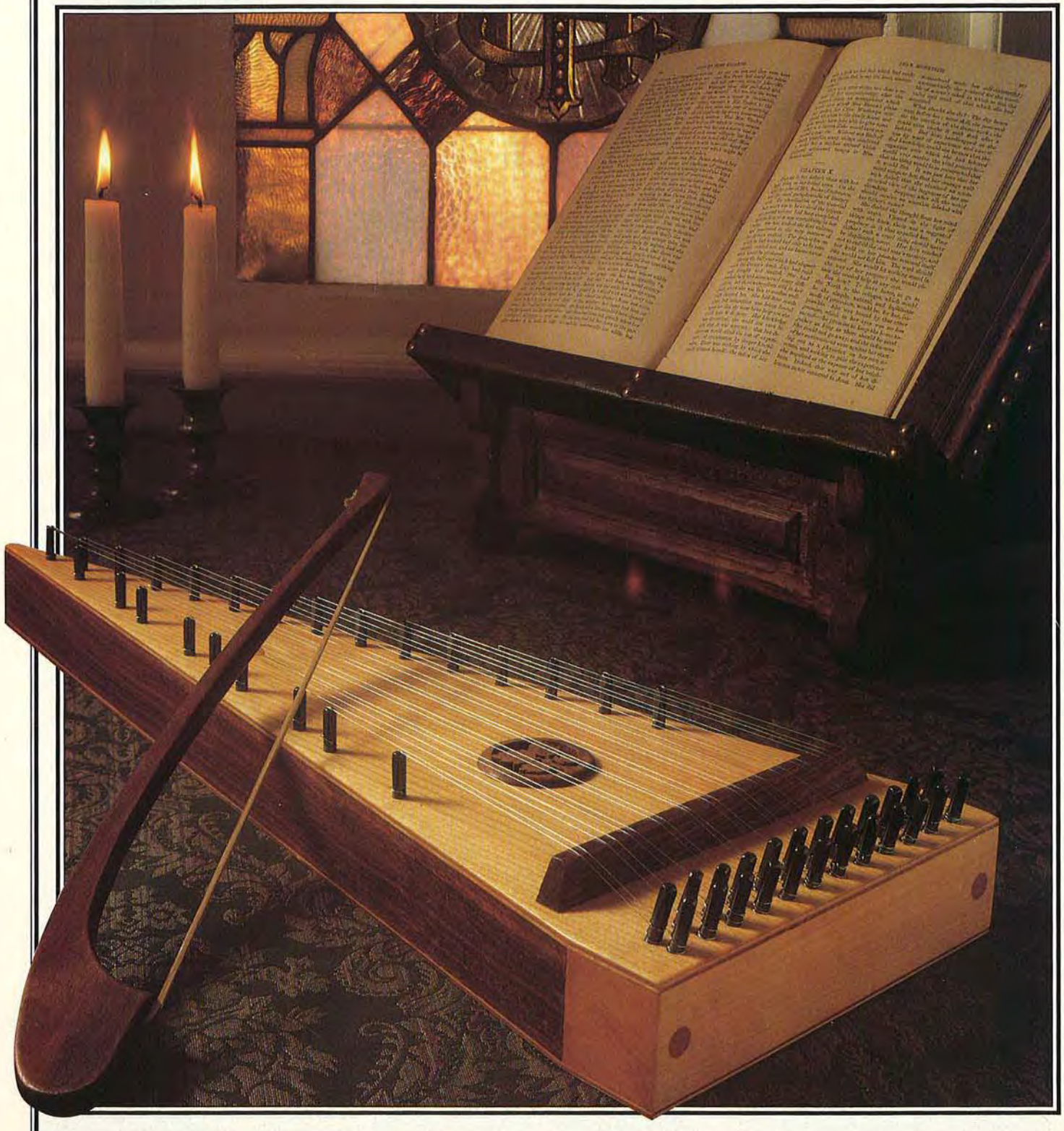
More buying points

- **Quality of cut.** Here, the planers produced mixed results. First, the good news. All of the machines planed a smooth surface right out of the box. Now, the bad news: All of the machines also cut 2"-long indentations (snipe) at both ends of the boards. In all fairness, we've seen larger, $1,000-plus thickness planers produce some snipe, and 4" of waste per board isn't unheard of with even those thicknessers.
- **Extension tables.** Again, the Makita and Ryobi models have the edge on their Taiwanese competitors. The Ryobi has fold-down roller extensions, and the Makita uses flat, chrome-plated table extensions. Both provide adequate support and adjust easily. The Taiwanese-made machines have a flimsy table made of black steel that will rust in time—and possibly mar workpieces. Because of Sears' particleboard feed table, you simply attach a longer piece of particleboard when you need a longer table.

Written by Bill Krier
Technical consultant: George Granseth
Photographs: Hopkins Associates

A SIMPLE STRINGED INSTRUMENT FOR YOUR MUSICAL PLEASURE

THE



BOWED PSALTERY

OK, all you would-be musicians out there. Here's your chance not only to build your very own instrument, but also to learn how to play it. The bowed psaltery, developed during the Renaissance, has a high-pitched, soothing, and distinctive sound that's most pleasing to the ear. See the Buying Guide for our source of hardware and a music lesson cassette and song booklet. You'll be playing a tune or two in no time at all.

Cut the pieces and build the frame

1 From ¾" walnut, cut the side rails (A) to the size listed in the Bill of Materials plus 1" in length.

2 Using the drawing *below* for reference, mark the cutlines on the top surface of each side rail. Miter-cut the ends where marked. (We cut the 10° miter on a tablesaw fitted with a miter gauge, and then cut the long taper on a bandsaw fitted with a ⅜"-wide blade.)

3 Cut the pin block (B) to size. (If you don't have 1½"-thick maple, laminate two pieces of ¾"-thick stock face to face.)

4 Transfer the end clamp pattern at *right* to a piece of 1½"-thick stock (a section of a 2×4 will work). Bandsaw the end clamp to shape.

5 Hold together the pieces (A, B) to check the fit. Sand or trim the ends of the side rails if necessary

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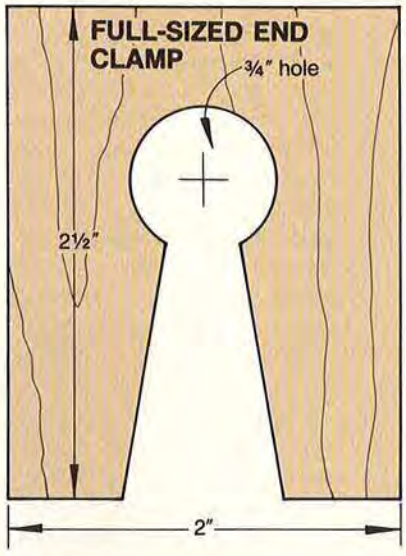
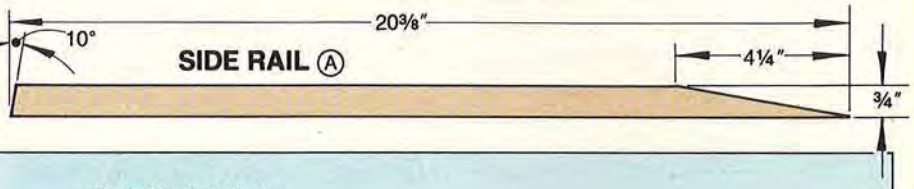
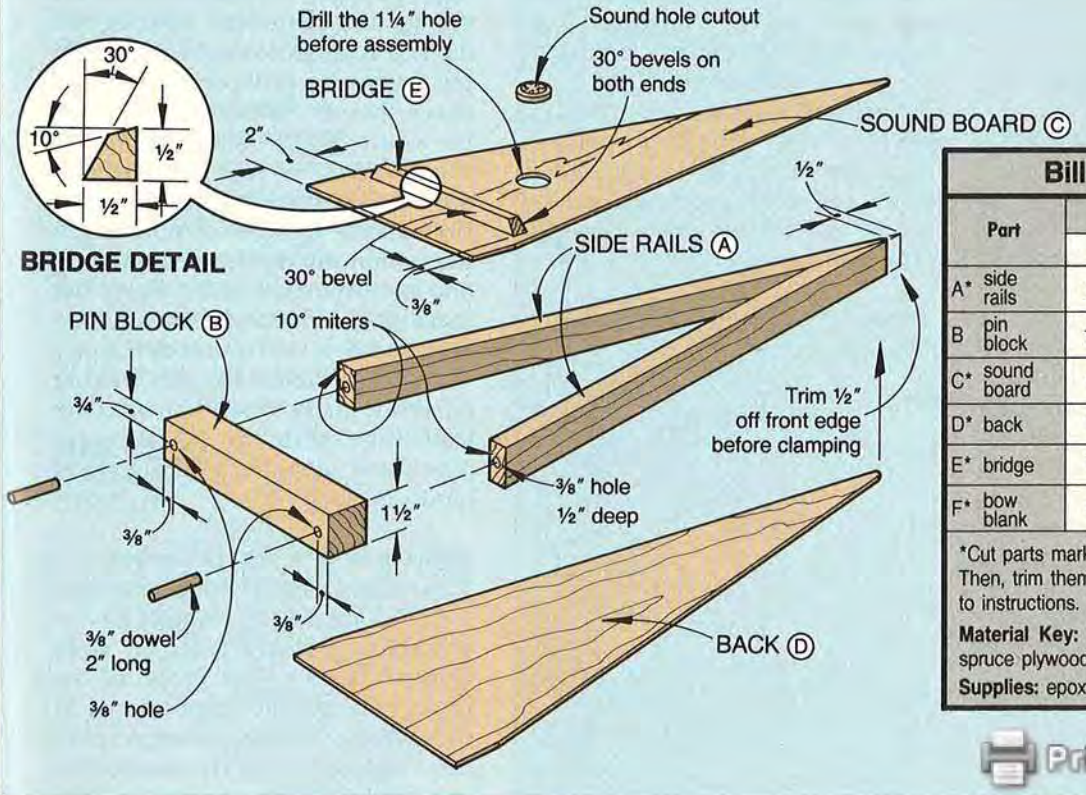






Bill of Materials

Part		Finished Size* T	W	L	Matl.	Qty.
A*	side rails	¾"	1½"	20⅜"	W	2
B	pin block	1½"	1½"	7⅛"	M	1
C*	sound board	⅛"	7⅛"	21½"	SSP	1
D*	back	⅛"	7⅛"	21½"	BBP	1
E*	bridge	½"	½"	6⅜"	W	1
F*	bow blank	⅜"	3"	15"	W	1

*Cut parts marked with an * to the size listed. Then, trim them to size according to the how-to instructions.

Material Key: W-walnut, M-maple, SSP-Sitka spruce plywood, BBP-Baltic birch plywood.

Supplies: epoxy, ⅜" dowel stock, finish.

Print this article

THE BOWED PSALTERY

Print this article

for tight-fitting joints. Trim ½" off the tapered end of the side rails where shown on the Exploded-View Drawing.

6 Position the side rails, pin block, and end clamp on a piece of waxed paper as shown in the photo at *right*. Mix epoxy (we used quick-set). Spread an even coat of epoxy on the mating surfaces, and clamp together the frame as shown in the photo, checking that the top and bottom surfaces of the pieces are flush. Also check that the ends of the side rails are flush. (The end clamp helps pull together the side-rail mitered ends tightly and provides a flat clamping surface.)

7 Using the Exploded-View Drawing for reference, mark the centerpoints and drill ⅜" dowel holes through the pin block and ½" into the side rails where indicated. (Be careful not to drill too deep and drill through the side of the rail.)

8 From ⅜" birch dowel stock, cut two pieces 2¼" long. Glue or epoxy the dowels in the holes just drilled. After the adhesive dries, trim off the excess dowel, and sand the frame smooth.

Now, add the soundboard and back piece

1 Position the psaltery frame on a piece of ⅛×8×22" Sitka spruce plywood (see the Buying Guide at the end of the article for our source). Trace the frame's outline onto the plywood for the soundboard (C). Repeat the process for the back (D), but on a piece of ⅛×8×22" Baltic birch plywood.

2 Using the Top View Drawing for reference, mark the centerpoint for the 1¼" soundboard hole. Bandsaw the soundboard and back to shape, cutting slightly outside the marked outline. Bore the soundboard hole where marked (we used a 1¼" Forstner bit and backed the plywood with scrap stock to prevent splintering).

3 Glue and clamp the soundboard (C) and back piece (D) to the frame. (We used woodworker's glue and long clamp blocks to protect the plywood and to hold the entire length of the plywood snuggly against the frame.)

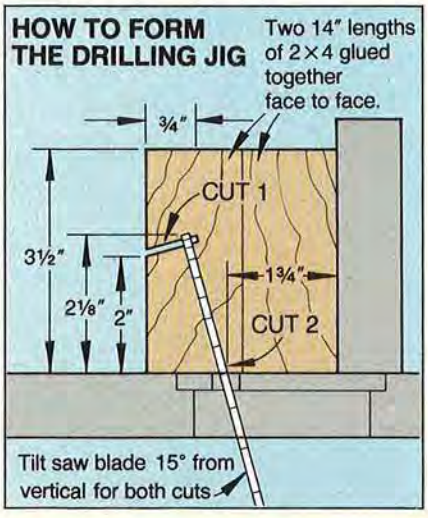
4 Sand the edges of the plywood flush with the edges of the frame. Hand-sand a slight round-over on all edges of the psaltery body.

With the top and bottom surfaces flush, epoxy and clamp the walnut side rails to the maple pin block.

Next, locate and drill the pin holes

1 Referring to the Top View Drawing, mark the four reference lines (used to locate the pin holes) on the top of the psaltery body.

2 Carefully measure and mark the pin-hole centerpoints on the four reference lines. (It is important to mark and drill the holes exactly where marked for proper spacing of the music wire.)



3 Build the drilling jig as illustrated in the drawing *below left*.

4 Drill 3/16" holes 1⅛" deep where marked on the reference lines along the two sides (not the end) of the psaltery body. (We used a brad-point bit to drill the holes because a twist bit tends to wander off the marked centerpoint.)

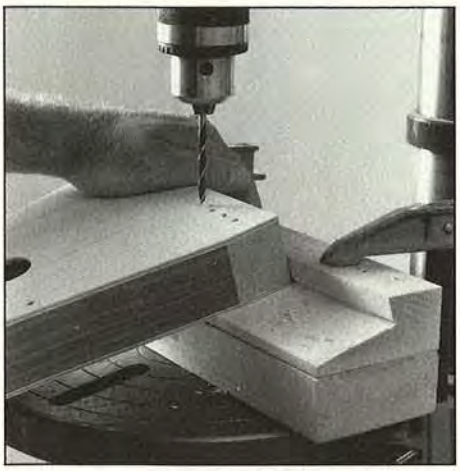
5 As shown in the photo *above right*, position the psaltery body on the jig, and center the bit over one marked reference line. Now, clamp the jig to the drill-press table and check that the bit still centers over the centerpoint. Using the jig for support, drill 3/16" holes 1⅛" deep at the marked centerpoints. (See the Hole Detail at *right* for reference.) Reposition the jig and drill the second set of angled holes along the remaining marked reference line.

6 Switch to a ⅛" bit and drill a pair of ¼"-deep holes for the C-string reference marks where shown. Plug each hole with the ⅛"-diameter plastic rod included in the psaltery hardware kit.

Build a bridge for the wires

1 Cut a piece of ¾"-thick walnut to 1×12" long for the bridge (E).

2 Tilt your tablesaw blade 30° from vertical. Bevel-rip one edge of the piece to create the shape shown in the Bridge Detail accompanying the Exploded-View Drawing. Tilt the blade 10° from vertical and



Using the angled drill jig for support and positioning, drill the pin holes.

bevel-rip the top edge. (The angled top edge helps ensure that the strings make firm contact with the wood "at the leading edge" where the strings begin to vibrate. A flat-topped bridge tends to create unwanted buzzes when the strings vibrate during playing.)

3 Miter-cut the ends of the bridge at a 30° angle to a length of 6⅜".

4 Glue and clamp the bridge to the soundboard where shown on the Exploded-View Drawing.

As an option: add the sound hole cutout

1 Using a photocopy or carbon paper, transfer the full-sized pattern *below* to ⅛" walnut (we resawed thicker walnut to size).

2 Cut the pattern to shape on a scrollsaw. Sand a round-over along the top outside edge of the cutout.

3 Center the cutout over the hole, and glue it in place.

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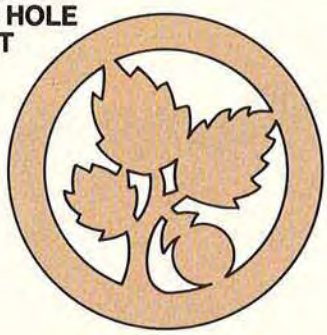
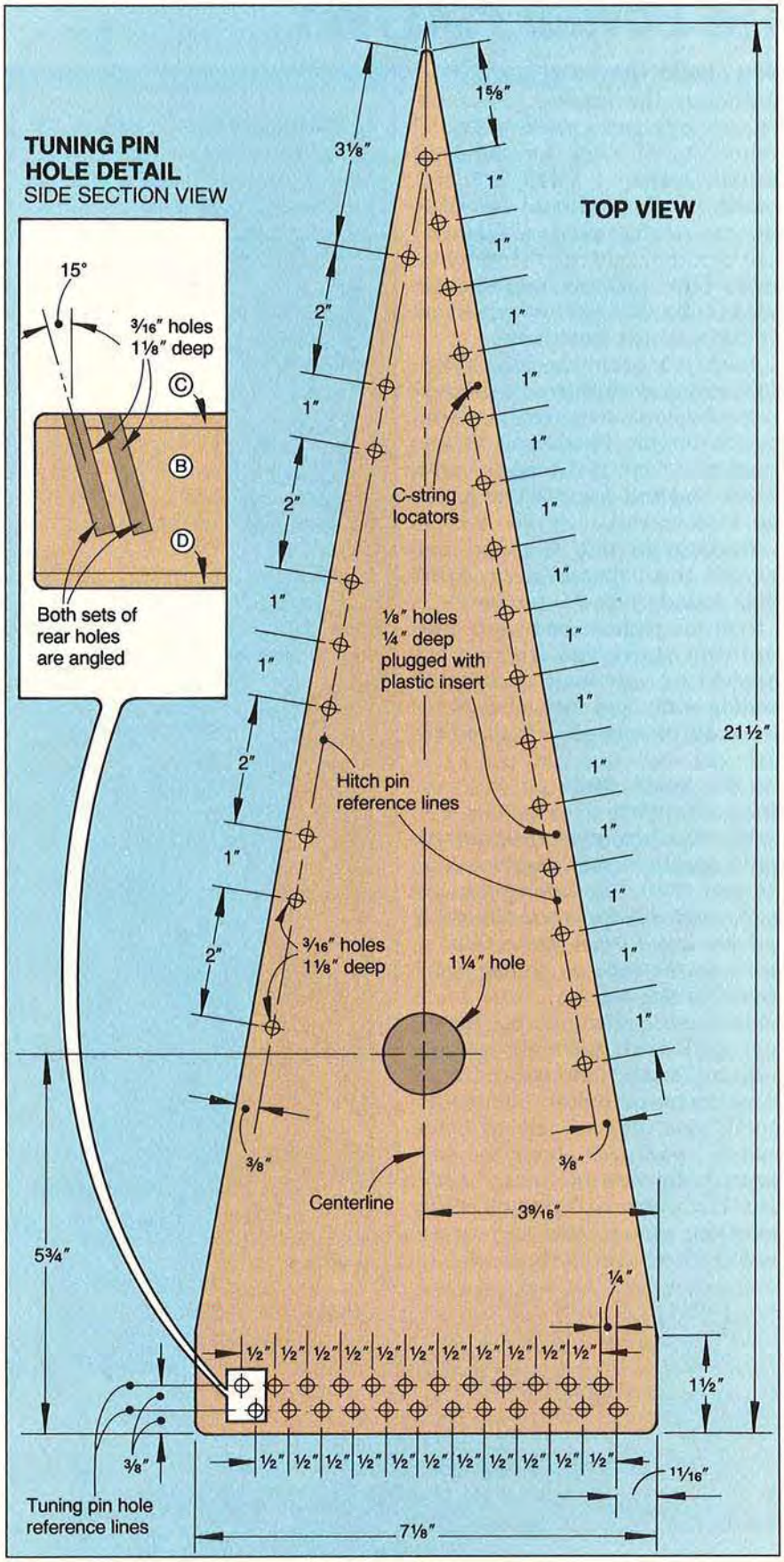
FULL-SIZED SOUND HOLE CUTOUT





THE BOWED PSALTERY

Now, build the bow and apply the finish

1 Resaw or plane a piece of 3×15″ walnut to ⅜″ thick for the bow blank (F). Draw a 3×15″ grid and transfer the bow pattern *below* to the grid. Using spray-on adhesive, transfer the grid to the walnut stock. (The psaltery hardware kit listed in the Buying Guide contains a full-sized bow pattern.)

2 As shown in the drawing *below right*, position your bandsaw fence so the blade is centered from side to side on the bow blank. Then, bandsaw a kerf 1¾″ long into the handle end and a kerf ¾″ long into the opposite end.

3 Bandsaw the bow to shape, and remove the paper pattern. Sand slight round-overs on the bow.

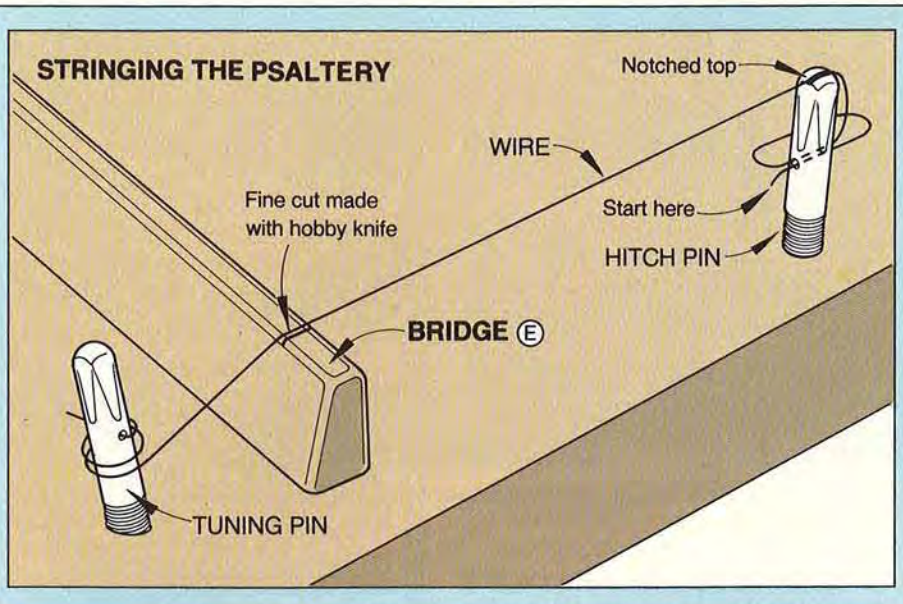
4 Sand the psaltery body and bow smooth. Apply the finish (we brushed on one coat of lacquer sanding sealer and then sprayed on two coats of semi-gloss lacquer.)

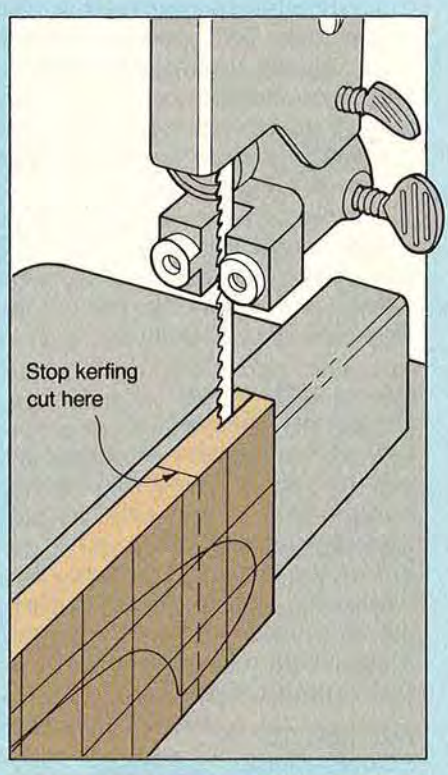
Set the posts, and string the wire

Note: *When stringing the psaltery, you'll use two types of pins—tuning and hitch. The tuning pins fit in the angled holes in the pin block and the hitch pins—those with a notch in the top—go in the holes above the side rails.*

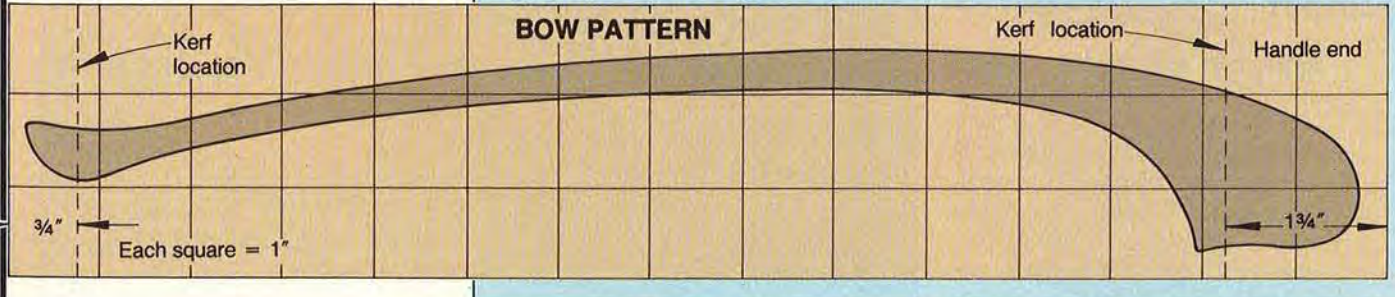
1 Clamp the psaltery to the top of your workbench as shown at *right*.

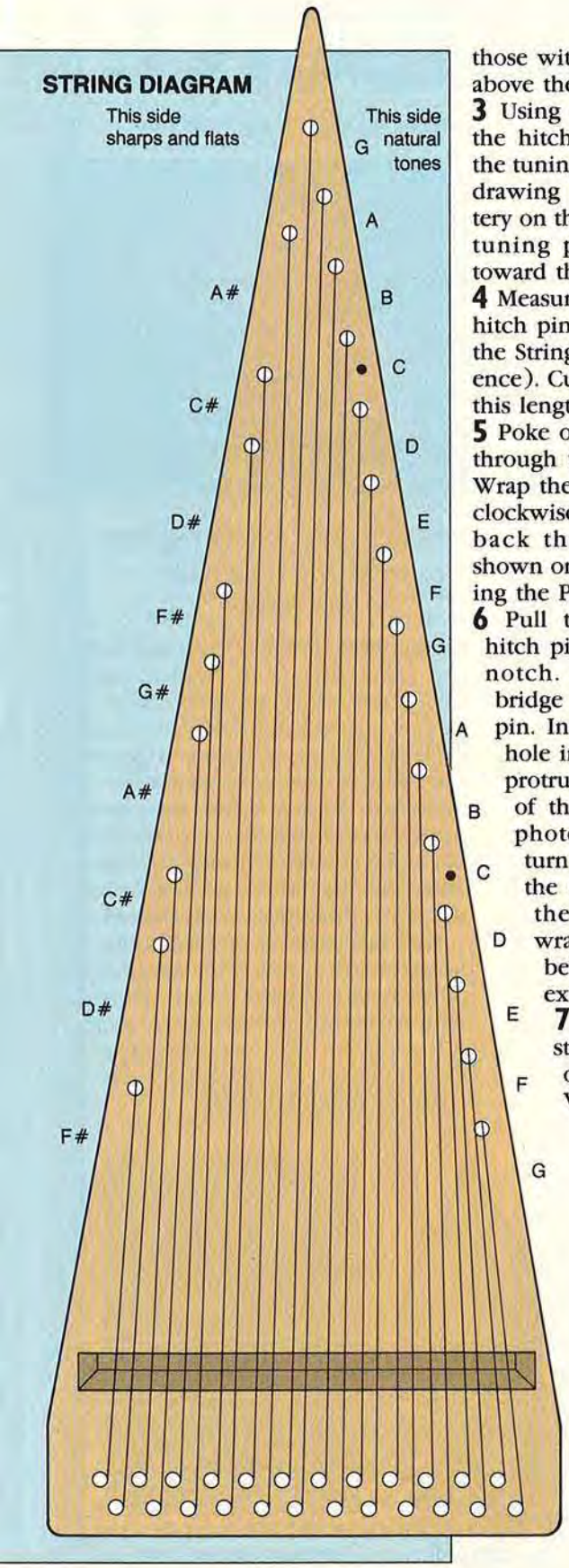
2 With a small rubber-tipped mallet or hammer, lightly pound the tuning pins into the angled holes until ⅝″ protrudes above the surface of the sound board. (We placed a piece of ⅝″-thick stock along the pins to use as a depth guide.) Then, tap the hitch pins—





Clamp the psaltery body to your workbench, and tighten the wires between the hitch and tuning pins.





those with notches—into the holes above the side rails.

3 Using the tuning wrench, twist the hitch pins so the notch faces the tuning pin where shown on the drawing titled Stringing the Psaltery on the opposite page. Twist the tuning pins so the holes point toward the bridge.

4 Measure the distance from the G hitch pin to the G tuning pin (see the String Diagram at *left* for reference). Cut a piece of music wire to this length plus 3".

5 Poke one end of the music wire through the hole in the hitch pin. Wrap the wire a half turn counterclockwise around the pin and go back through the hole where shown on the drawing titled Stringing the Psaltery.

6 Pull the music wire over the hitch pin so the wire rests in the notch. Pull the wire over the bridge and back to the tuning pin. Insert the wire through the hole in the tuning pin so that it protrudes through the other end of the hole. As shown in the photo on the opposite page, turn the pin clockwise with the tuning wrench to tighten the wire. The wire should wrap around the tuning pin below the hole. Clip off the excess wire.

7 Repeat the process to string the psaltery as shown on the String Diagram. With a hobby knife (we used an X-acto), make a fine cut on the walnut bridge under each wire to keep the wires spaced evenly on the bridge.

Add the bow hair to the bow

1 Tie a knot about ¼" from one end of the bow hair. Slip the bow hair through the small kerf, and comb the hair—a fine-toothed comb works well—so the hairs are straight and untangled. Pull the unknotted bow hair through the kerf in the other end of the bow and mark the location on the bow hair of the second knot. Tie a knot where marked, and string the knotted end onto the bow handle. If the bow hair isn't taut, reposition the knot and try again. Put a drop of Super Glue on both knots to keep them from unraveling.

2 To initially prepare the bow hair for playing, chip off a bit of rosin from the cake enclosed with the hardware kit. Pulverize the rosin into a fine dust, and work the rosin dust into the entire length of the bow hair. After this has been done, you'll need to occasionally draw the bow across the rosin cake to restore it.

3 Finally, rosin up the bow, turn on the cassette listed in the Buying Guide and tune each string. (You could also tune the psaltery comparing the tones to a piano.) Then, use the other side of the cassette and the song booklet to learn how to play your new instrument.

Buying Guide

- **Psaltery hardware kit.** One piece of ⅛×8×22" Baltic birch plywood for back and one piece of ⅛×8×22" Sitka spruce plywood for the sound board, ⅛"-diameter plastic insert 1" long, tuning wrench, 48 pins (24 notched hitch pins and 24 tuning pins), 50 feet of music wire, rosin for bow, one hank of bow hair, full-sized bow pattern. $43 ppd. St. Croix Kits, 423 S. Main St., Stillwater, MN 55082.
- **Music lesson kit.** Tuning and song cassette and booklet. If ordering the hardware kit above, add $9.95 for the lesson kit. If ordering this alone, the lesson kit sells for $12.95 ppd. To order, use the address listed above.

Produced by Marlen Kemmet
Project Design: David Marks
Photographs: Hopkins Associates; Bob Calmer
Illustrations: Kim Downing; Mike Henry

Print this article

CARVE A BLUEGILL

RICK BEYER CAPTURES WISCONSIN'S FAMILY FISHING FAVORITE

Racine, Wisconsin, carver Rick Beyer has fished since he was a kid. Today, though, he hardly finds time because he's busy carving award-winning fish.

Cherry and a natural finish trademark Rick's work. But it's not just cherry's striking color that wins him top honors. "It's important to portray as much action as possible," he says.

Rick Beyer

Getting started in cherry

Rick carves cherry with power-carving equipment, such as a Dremel Moto-Tool. With only hand-carving tools, opt for softer stock, such as basswood.

For a fish à la Rick Beyer, you'll need a solid block of cherry measuring 6"×9" and a full 2½" thick. "Pick wood with straight grain running the length and no large, dark sap pockets," Rick advises. (Or start from a blank, see *below.*)

Trace the side view on the wood, then bandsaw the fish to shape. Next, stand the block up and draw on the top view. Saw along these lines.

To remove the extra wood along the back and bottom fins, around the head, and along the lower stomach, tilt your bandsaw table about 45° and follow the outline of the sawed-out blank. Now, carve the fins until you reach a 3/16" thickness. Then, after referring to the cross section shown in the pattern, shape the body.

Next, sketch in an elongated, S-shaped curve on the tail fin. Place the body in a padded vise and remove the wood on the tail down to 3/16" of thickness for final detailing.

Now you can start on the details—gills, eyes, and lips. Then, sand the fish's body and fins, tapering an edge on all body fins.

Featuring the fins

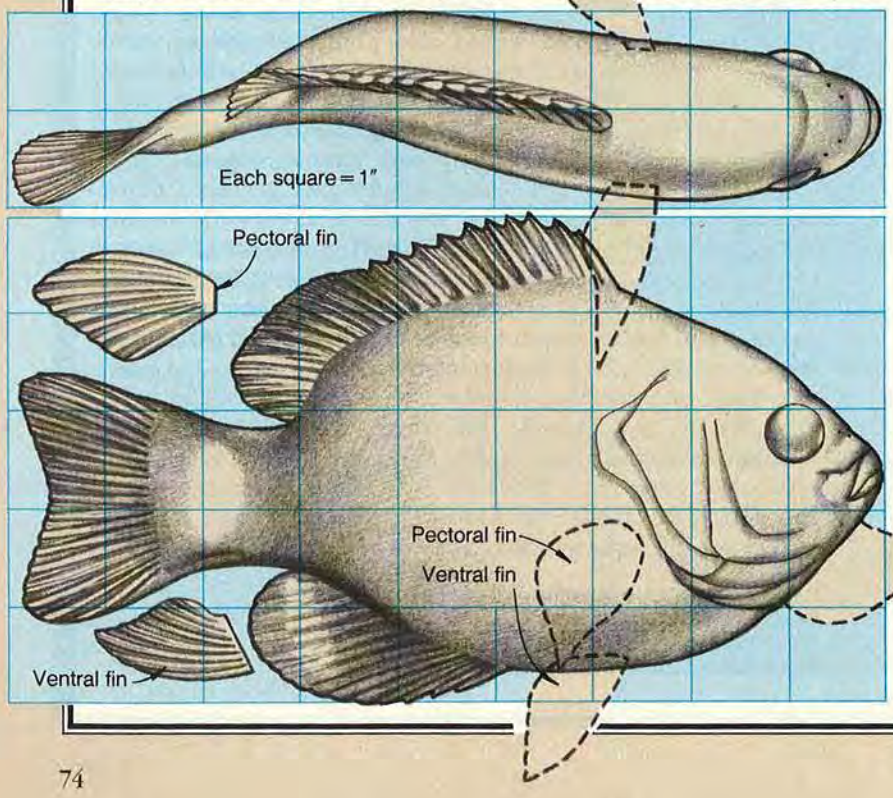
Pencil in and carve the ridges on the dorsal, lower, and tail fins. Cut the ventral and pectoral fins from scrap cherry with the grain running in the same direction as the fin ridges. Leave fins about 3/8" thick so you can add movement.

Next, hold the ventral and pectoral fins to the body and draw their base outline where they attach. Carve a slot for each fin at the angle you wish it to protrude. Trim the fins to fit. Finish-sand the body, then glue in the fins.

Find the location of the double nostrils (about 3/16" away and down from each eye). Drill them with a 1/32" bit.

For a finish, Rick uses Formby's gloss tung oil. He sands between coats for smoothness.

One in a collection of regional patterns from the nation's top carvers



To order a cherry blank and fins, send $14 (U.S.) ppd. to: *Fish, Beyer Galleries, 1115 N. Main, Racine, WI 53402.*

For a free, full-sized pattern, send a self-addressed, stamped (foreign readers include an intl. reply coupon), business-sized envelope to: **BLUE-RIBBON BLUEGILL, *WOOD*® Magazine, Box 11454, Des Moines, IA 50336-1454.**

Design: Rick Beyer
Drawings: Jim Stevenson
Photograph: Bob Calmer

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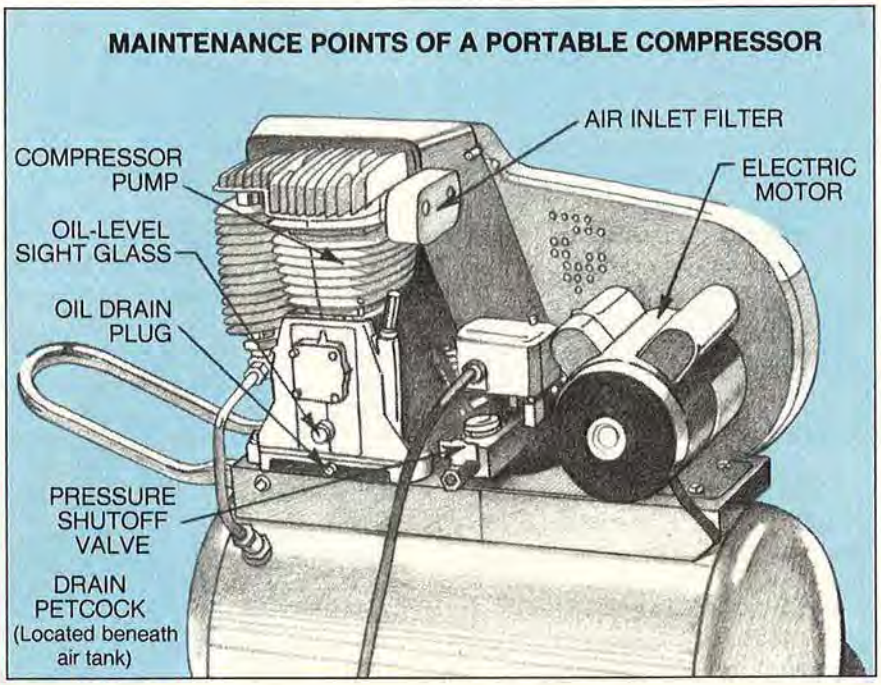
TIPS ON KEEPING YOUR AIR COMPRESSOR ALIVE AND WELL



Even if you only rely on your air compressor to blow occasional sawdust, take care to keep it healthy.

Your air compressor's full-life expectancy begins with the routine maintenance outlined in the owner's manual. Representatives of the four major compressor manufacturers, though, say there's more you should do.

Supply full power

Most small (½–5 hp.) compressors operate electrically. But, to be efficient and run smoothly, your air compressor needs the full dose. Cautions Dave Pooley of DeVilbiss Co., which builds Sears compressors, "Using a long, lightweight extension cord reduces the voltage to the compressor and can cause the motor's coils to overheat and burn up. For an extension to the job site, add air hose, not electrical line." Gary Wenderoth of Campbell-Hausfeld, agrees. "Insufficient electrical current is the No. 1 killer."

Most compressor manufacturers strongly advise plugging their products directly into an electrical outlet to avoid the problem of voltage drop. But even then, they say, some circumstances can conspire to underpower your compressor motor. First, other motor-driven appliances, such as a freezer or a washer operating simultaneously on the same electrical circuit, will draw down available current and cause the compressor motor to overheat. "Less obvious is the possibility of inadequate power flowing into your home and shop," Pooley continues. "If your compressor isn't running with its usual zip—especially during those hot, muggy days of the air-conditioning season—check the quantity of power on the line. It's a lot cheaper to spend $20 for a voltmeter to detect an insufficient power supply than to let low voltage ruin your compressor."

If you're not receiving 115 or 120 volts (or 230 volts for larger compressors), have your power company check out the line. They

Continued on page 78

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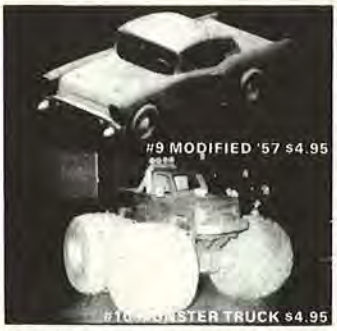

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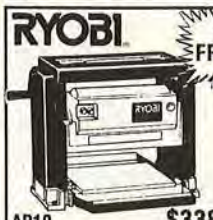

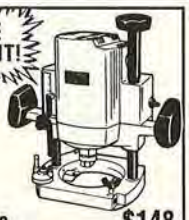

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COMPRESSORS

Continued from page 76

may have to replace the transformer supplying your house.

Provide enough air

A filter on the air intake keeps dust, dirt, and overspray from being sucked into your compressor pump. Left unattended, that filter clogs enough to make your compressor work harder and hotter, causing undue wear.

"Ideally, compressors work best in a cool, clean, well-ventilated environment," notes Pete Dieser of Sanborn Manufacturing Co. "Avoid dusty conditions, such as sandblasting, by adding extra hose to move the work farther away from the compressor. If the unit must run in a hot, dusty place, clean or replace the air filter more often."

Besides the air filter, Pooley recommends keeping the compressor pump clean. "Occasionally, blow the dust off. And, cover the motor with a plastic bag and wash down the compressor pump with a degreaser. That keeps the air-cooling fins clean and operating."

Add tender loving care

If you have an oil-lubricated compressor, check the oil level before each use and add oil when indicated. After 40 hours, change the compressor oil.

"And, to ease the motor's workload, don't forget to regularly inspect and tighten belts on belt-driven compressors," advises Ingersoll-Rand's Charlie Curry. "Each time you use your system, check the pressure-relief valve, too. Never block this valve or increase the pressure setting for more air. That risks overheating."

Finally, if you have a tank-type unit, drain the tank of air and condensation at the end of every day of use. If you don't, moisture will infiltrate the air line with disastrous results, particularly when you spray oil-based paint. Water left in the tank also rusts the inside and weakens its walls.

Illustration: Jim Stevenson

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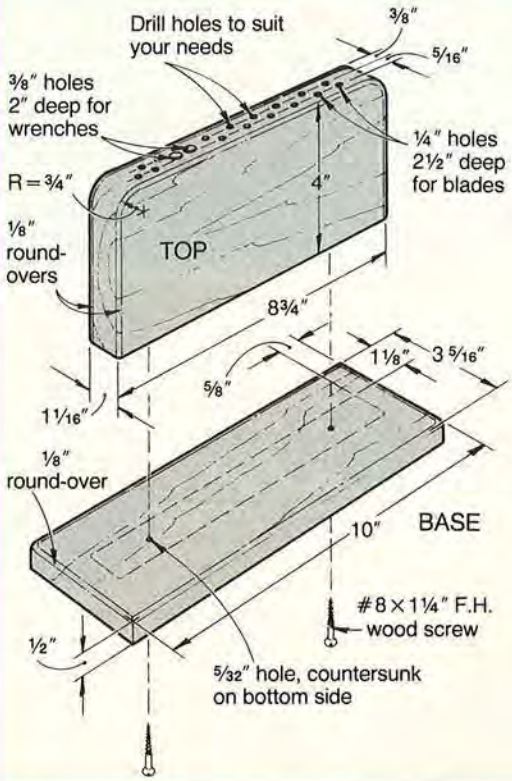

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Now that you've learned more about buying scrollsaw blades from the article starting on page 56, here's a convenient way to keep those similar-looking blades separated, organized, and close at hand.

Using the dimensions on the Exploded-View Drawing at *left*, cut the base to size from ½" stock and the top from 1 1/16" material. Mark a pair of reference lines along the top edge of the top piece. Locate hole centerpoints for your blades, wrenches, and other accessories along the two reference lines where shown at *left*. Draw a ¾" radius on the top corners of the top piece and cut each to shape. Rout ⅛" round-overs along the edges of the base and top piece where shown on the drawing. Using a drill press, drill the holes in the top piece. Sand both pieces smooth. Then, mark scrollsaw-blade reference numbers on the side of the top piece with a permanent, fine-tipped felt marker. Drill the mounting holes, and glue and screw together the two pieces. Apply a clear finish and add your blades.

Illustration by Kim Downing

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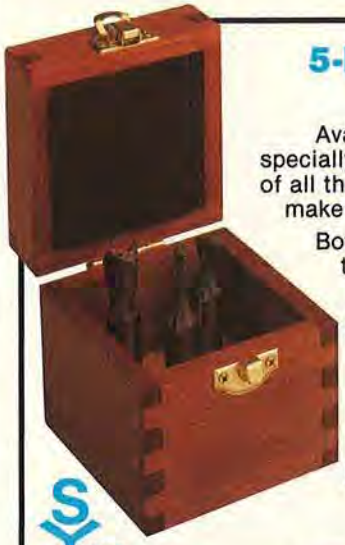

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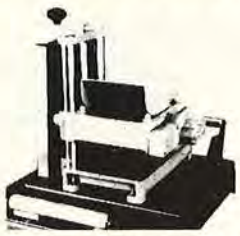

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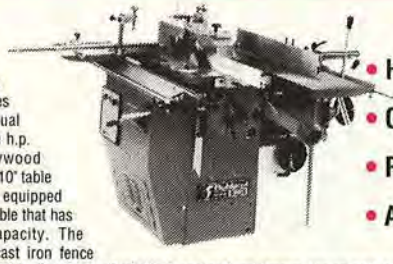

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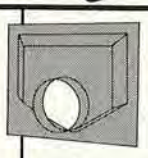

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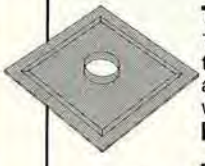

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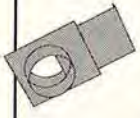

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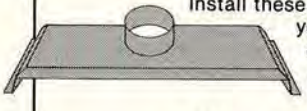

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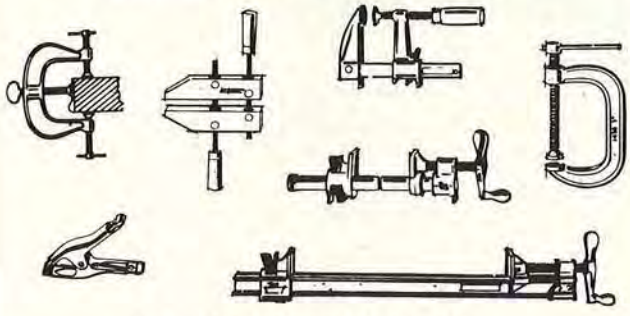

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—Tested by Bill Krier

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—Tested by Jim Downing

Graphic Source clip art books, suggested price of $5.95 at art supply stores nationwide. For more information about dealer locations contact Graphic Products Corporation, 1480 S. Wolf Rd., Wheeling, IL 60090. Phone 708/537-9300.

Continued on page 86

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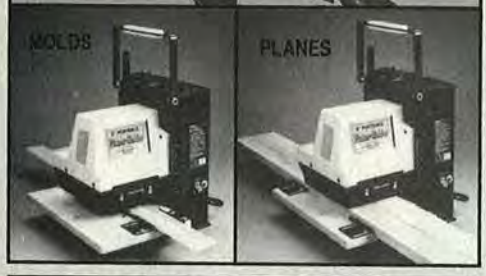

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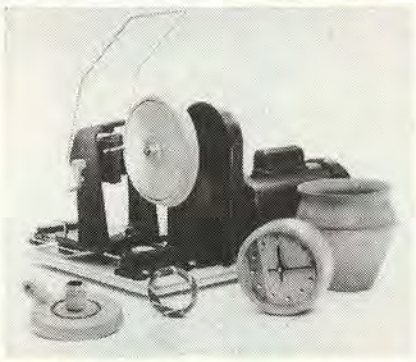

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PRODUCTS THAT PERFORM

Continued from page 84

A user-friendly wood putty

Unlike some wood putties that contain pungent-smelling, toxic, and flammable solvents such as acetone, water-based Elmer's Fill 'N' Finish releases a nontoxic and nonflammable vapor that has a mild ammonia-like smell. And, I found the product to be consistent in mixture, even after sitting on a shelf for weeks.

Once applied, it dried quickly, sanded superbly, took a stain well, and didn't shrink excessively. When finished, I cleaned up the putty knife with water. And, to top it off, Elmer's places a small, but handy tips pamphlet on the outside of every lid.

However, I hope Elmer's comes out with a greater variety of colors. You can only buy the putty in two shades: dark and light tan.

—Tested by Jim Boelling

Elmer's Fill 'N' Finish Wood Filler (putty), available at discount and hardware stores nationwide. Suggested retail prices: ¼ pint, $2.49; ½ pint, $3.49; and 1 pint, $5.19.

Big performance from a small turning tool

Although I turn mostly projects of goblet size or larger, I found Robert Sorby's micro turning tools invaluable for detailing cuts and those occasional miniature projects. Constructed in Sheffield, England, of high-speed steel and sturdy ash handles, the tools follow in the same high-quality tradition as Sorby's larger tools.

The 10"-long tools have 4" blades that vary from a 1/16"-wide cut for the parting tool to a ¼"-wide cut for the roughing-out gouge, round-nose scraper, and skew chisel. The spindle gouge has a ⅛"-wide blade. Because of their dainty size, sharpening them presented a challenge. You must take care not to burn the blades by placing excess pressure against the grinding stone.

—Tested by Marlen Kemmet

Sorby's five-piece micro-turning tool set, catalog No. STT45, $70.60 ppd. from Constantine's, 2050 Eastchester Rd., Bronx, NY 10461. Tools also available individually. Call 800-223-8087 (orders only) or 212/792-1600 for information.

Continued on page 88

Finally A Solution

to accurately setting
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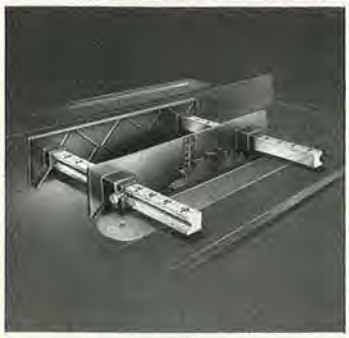

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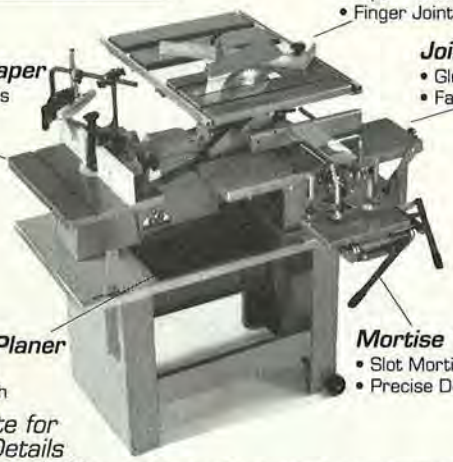

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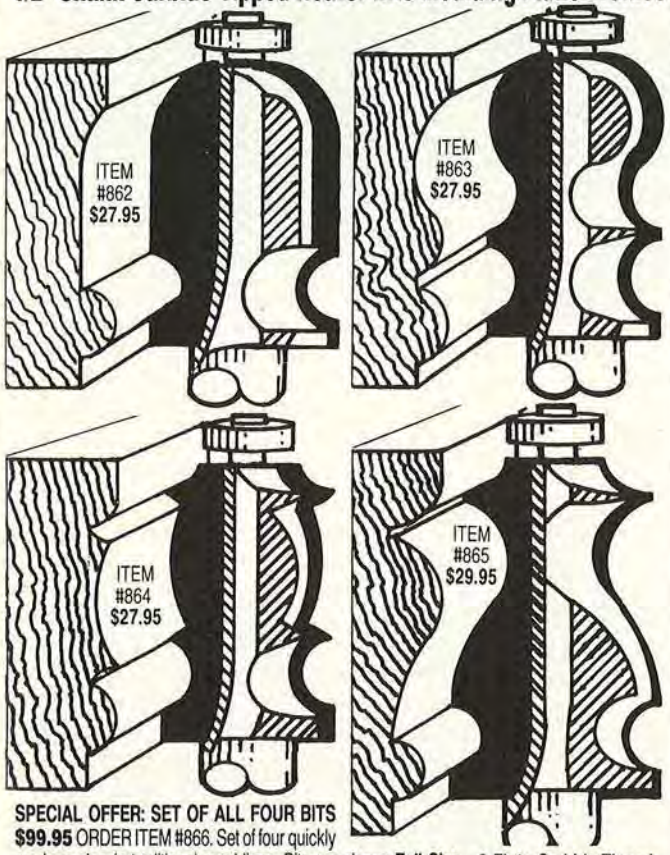

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PRODUCTS THAT PERFORM

Continued from page 86

A cuting time-saver

Here's my nominee for time-saver of the year: Instead of a reversible stile-and-rail cutter, why not twin cutters? Bosch's separate stile-and-rail cutter heads for ½" routers mean no time wasted reversing shims and cutters. A switch from stile to rail cuts comes by changing bits and positioning the workpiece. In most cases, you only need to do a small amount of measuring and test-cutting for a tight fit. Plus, with Bosch's quality carbide-tipped bits, you'll have a tool that will last.

The twin-bit sets come in beading- and ogee-head styles. For those more interested in saving money than time, you can reverse a single ogee bit to make both stile and rail cuts, but that option isn't available with the beading bits.

—Tested by Steve Oswalt

Bosch beading and ogee stile-and-rail cutters, $129.50 list price per set at hardware stores nationwide. Check the Yellow Pages for your nearest Bosch dealer.

Wood glue of a darker shade

The strength and chocolate hue of Elmer's dark wood glue make the product ideal for use with oak, cherry, mahogany, walnut and other hardwoods. It has all the properties of Elmer's regular wood glue, plus its color helps hide thicker glue seams that often occur in laminations, especially those made of darker woods.

—Tested by Steve Oswalt

Elmer's dark wood glue, $3.19 suggested retail price for an 8-oz. container, available in hardware and department stores nationwide.

A sharp bargain

Wet or dry, these synthetic stones put a quick edge on any cutting tool. The super hard, bonded aluminum oxide cuts quickly and refuses to dish-out. The ultrafine white stone added polish to my carving edge, but medium black was clearly the workhorse. The slips and specialty stones fit neatly between saw-blade teeth and other hard-to-reach cutting areas.

—Tested by Steve Oswalt

Wayne Barton's ceramic sharpening stones and slips $18.95–$27.95 ppd. from Woodcraft, Dept. WBH, 210 County Industrial Park, P.O. Box 1682, Parkersburg, WV 26102. Call 800-225-1153.

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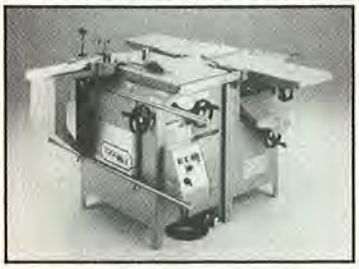

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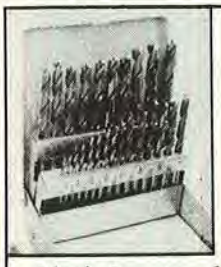

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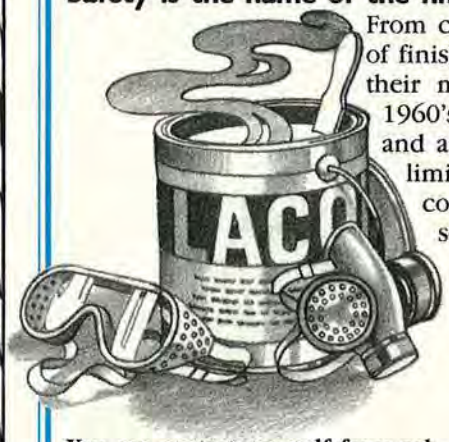

You can protect yourself from solvent-based finishes, but the environment has no defense against the harmful fumes they release.

From coast to coast, manufacturers of finishing products have safety on their minds. The reason: Since the 1960's, when certain air districts in and around major cities in California limited the content of volatile organic compounds (VOC) in finishing products sold in those areas, at least five other metropolitan areas have enacted similar limits. Today, Chicago, Dallas, New York City, Phoenix, and the entire state of New Jersey, have similar limits.

And, what is a VOC? With finishing products it's the hydrocarbon-based solvents used to disperse the solids. These solvents contribute to a number of environmental problems, including ozone buildup in the lower atmosphere. Manufacturers expect VOC legislation to spread nationwide, and in the ensuing rush to lower the VOC content of their products, manufacturers have improved the performance levels of safer, water-based finishes. These products are nontoxic, nonflammable, relatively odorless, and they clean up in soap and water.

"This is the way it's going to be," said Fred Adams, a spokesperson for Parks/Carver Tripp, a company that recently introduced an entire family of water-based stains, finishes, and finish remover that the company has dubbed its "Safe and Simple" line. "Water-based finishes aren't new," Adams told us, "but water-based products that perform for the consumer are new."

Water-based finishes pose little threat to you or the environment.

For more information on this topic, and news about one woodworker who has mastered the use of a water-based finishing product, see page 42.

Bosch and Emerson acquire Vermont-American

Two of the world's biggest names in power-tool making, Robert Bosch Power Tool Corporation and Emerson Electric, have pooled their resources to purchase Vermont-American, one of the biggest names in power-tool accessories. Bosch, headquartered in Stuttgart, West Germany, and St. Louis-based Emerson now await Justice Department approval before the deal becomes final. To make the offer, Bosch and Emerson formed the Maple Acquisition Corp., through which both companies will jointly manage Louisville-based Vermont-American and its subsidiaries. Purchase price: $440 million.

Currently, Vermont-American operates 28 plants in North America, Europe and Australia, and counts blade-manufacturer DML among its divisions. V-A makes many of Sears' power-tool accessories, such as drill bits and saw blades. Bosch, one of the largest manufacturers in Europe, produces portable tools in Germany and New Bern, N.C. Emerson manufactures most of Sears' stationary power tools, supplies induction motors to many manufacturers, and also owns Skil and Dremel. Officials of the involved firms wouldn't comment on what effect, if any, the sale will have on any of their product lines.

Illustrations: Jim Stevenson

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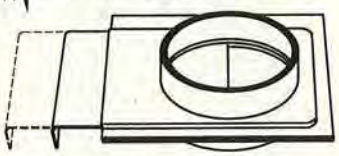

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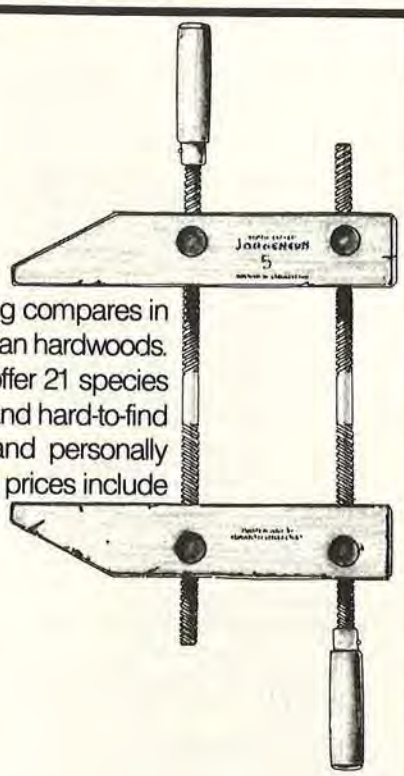

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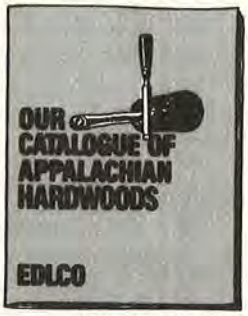

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0219-1	9.6V cdlss. drill w/case	277	165
0385-1	7.2V cdlss. drill w/case	174	109
0224-1	¾" drill 4.5A magnum	189	114
0234-1	½" drill 4.5A mag 0-850 rpm	199	107
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6539-1	Cordless screwdriver 190 rpm	113	69
6540-1	Cdlss. screwdriver w/bits & case	154	99
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3102-1	Plmbrs rt angle drill kit	330	189
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6747-1	Drywall driver-0-2500	154	95
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3300-1	½" v. spd. magnum rt angle kit	299	185
5660	Router 1½ H.P.—10 amp	299	189
5680	Router 2 H.P.—12 amp	350	225
5455	⅞" polisher 1750 rpm	209	129
6215	16" chain saw	280	179
8975	Heat gun	89	59
6365	7¼" circular saw	195	114
6366	7¼" circ saw w/fence & bld	204	119
6368	7¼" circ saw w/fence, bld & cse	233	129
0216-1	2 spd cordless drill HI-torque	222	129
0235-1	½" drill keyless chuck mag	209	119
6016	¼ sheet pad sander	79	52
6145	4½" grinder 10,000 rpm	154	95
6142	6145 w/case & access.	192	115
6749-1	Drywall gun 0-2500 4.5A	189	125
6377	7¼" worm drive saw	295	169

FREUD SAW BLADES

⅝" Bore—Industrial Grade

CARBIDE TIPPED SAW BLADES

Item No.	Description	Diam.	Teeth	List	Sale
LU72M010	Gen. Purp. A.T.B.	10"	40	58	39
LU81M010	Gen. Purp. T.Ch.	10"	40	65	43
LU82M010	Cut-off	10"	60	77	45
LU84M011	Combination	10"	50	65	42
LU85M010	Super Cut-off	10"	80	96	55
LM72M010	Ripping	10"	24	57	36
LU73M010	Cut off	10"	60	70	44
LU87M010	Thin kerf	10"	24	60	39
LU88M010	Thin kerf	10"	60	74	44
LU98M010	Ultimate	10"	80	107	69
LU89M010	Non-ferrous metal	10"	72	87	55
PS203	Gen'l Purp.	7¼"	24	25	19
PS303	Plywood	7¼"	40	36	27
DS306	6" Dado - Carbide			184	105
DS308	8" Dado - Carbide			196	112
F0	1¼"-x⅝" Biscuits 1000-Qty.			32	27
F10	2⅛"x¾" Biscuits 1000-Qty.			32	27
F20	2⅝"x1" Biscuits 1000-Qty.			34	29
FA	Assorts Biscuits 1000-Qty.			34	29
WC104	4 pce. chisel set w/case ¼ "1"			54	39
WC106	6 pce. chisel set w/case ¼ "1"			73	52
WC110	10 pce. chisel set w/case ¼ "1½"			119	75
FB100	16 pce forstner bit set ¼ "2½"			284	155
94-100	5 pce router bit door system			288	155
JS100	Biscuit Jointer w/case			300	159
CE82	Planer w/case, carb blds. & guide			218	129
FT2000	3¼ H.P. plunge router			299	189

MAKITA CORDLESS

		List	Sale
6070DW	¾" var. spd. rev. drill, 7.2v	130	76
6071DWK	¾" var. spd. rev. drill w/removable batt, 7.2v	199	109
5090DW	3⅜" saw kit, 9.6v	256	139
5600DW	6¼" circular saw, 10.8v	350	179
6010DWK	¾" cordless drill kit, 7.2v	164	95
6010SDW	¾" cordless drill, 7.2v	99	65
DA3000DW	⅜" angle drill, 7.2v	251	135
8400DW	Hammer drill kit, 9.6v	272	149
4390DW	9.6 volt cdls. recip saw kit	230	128
4300DW	Jig saw kit comp., 9.6v	232	125
6012HDW	2 spd. driver drill w/clutch & case, 9.6v	236	117
6092DW	V/spd. drill, kit complete	250	123
6093DW	V/spd. drill w/clutch—complete	261	127
6891DW	Drywall gun 0-1400, 9.6v	237	129
632007-4	9.6 volt battery	48	30
632002-4	7.2 volt battery	40	28
5007NBA	7¼" saw w/elec. brake	233	128
5008NBA	8¼" saw w/elec. brake	284	158
B04510	¼ sheet pad sander	85	49
9900B	3"x21" belt sander w/bag	268	149
9924DB	3"x24" belt sander w/bag	282	152
9045N	½ sht fin. sand. w/bag	231	134
4200N	4¾" circ. saw 7.5 amp	225	127
4301BV	Orb. v/sp jig saw 3.5 amp	289	155
JR3000V	Vs. recip saw w/case	227	129
LS1020	New 10" miter saw	463	245
9820-2	Blade sharpener	373	209
1900BW	3¼" planer w/case	209	115
1100	3¼" planer w/case	401	219
9207SPC	7" sander-polisher	276	155
3601B	1⅞ H.P. router	255	139
3700B	½ H.P. trimmer	190	115
9501BZ	4" grinder, 3.5 amp	126	75
B04530	6" round sander	101	59
B04550	¼" sheet pad sander w/bag	88	55
DA3000R	⅜" angle drill	270	148
DP4700	½" v/sp w/rev. 4.8 amp	209	125
HP2010N	¾" v/sp hammer drill w/case	300	169
2708W	8¼" table saw	504	259
2711	10" table saw w/brake	841	489
2030N	12" planer/jointer	3120	1789
2040	15¾" planer	2595	1489
1806B	6½" planer kit w/case	679	359
5005BA	5½" circular saw	223	129
9503BH	4½" sander-grinder	146	89
6404	⅜" drill 0-2100 rpm, 2 amp.	104	65
6510LVR	⅜" drill rev. 0-1050 rpm	145	79
6013BR	½" drill rev. 6 amp	241	139
5402A	16" circular saw - 12 amp	636	349
3612BR	3 H.P. plunge router	377	195
9401	4"x24" belt sander w/bag	318	169
3620	1¼ H.P. plunge router w/case	192	109
4302C	V/spd. orb. jig saw	302	165
5077B	7¼" Hypoid saw	252	135
LS1440	14" Miter saw	721	425
2414	14" cut-off saw AC/DC	351	205
5007NB	7¼" circ saw 13 amp	209	114
3612B	3 HP plunge router sq/b	377	195

SENCO AIR NAILERS

Model		List	Sale
SFN1	Finishing nailer 1" - 2"	377	269
SFN2	Finishing nailer 1½" - 2½"	571	395
SN325	Nailer 1⅛" - 3¼"	665	449
M2	General purpose 1⅜" - 2"	475	345
SN4	General purpose 2" - 3½"	685	469
LS2	Pinner ⅝" - 1"	351	255
SKS	Stapler ⅝" - 1½"	351	249
LS5	Pinner, 1"-1½"	399	295
PW-RFR	Roofer, ½"-1¼"	351	255

SKIL SIZZLERS

Model		List	Sale
5510	(551) 5½" circ saw	112	95
5625	(552) 6½" circ saw	175	124
5656	(553) 7¼" circ saw	132	119
5750	(807) 7¼" circ - drop foot	198	142
5785	(808) 8¼" circ - drop foot	216	149
5790	(810) 10¼" circ - drop foot	400	269
5825	(367) 6½" worm saw	229	155
5855	(825) 8¼" worm saw	250	164
4580	Vari - orbit jig saw w/cse.	144	105
3810	10" Miter saw	263	215
7575	¼" palm sander	52	49
7313	3x18 belt sander 4.5A	72	65
77	7¼" worm drive saw	230	145
5350	2½ HP circ. saw	80.99	77
5250	2¼ HP circ. saw	68.99	66
2735-04	12v v/spd. cordless drill complete w/case. & 2 batt.	210	139

LEIGH DOVETAIL JIGS

D1258-12—List 314.00—Sale 265.00

D1258-24—List 375.00—Sale 305.00

LEIGH INSTRUCTIONAL VIDEO—SALE 29.00!!

MMT 500 NEW	24" multiple mortise & tenon jig	509	399
MMT	12" multiple mort. & tenon attachment for D1258-12	269	219
MMT	24" multiple mort. & tenon attachment for D1258-24	299	239

HITACHI TOOLS

		List	Sale
TR8	Plunge router, 1½ H.P.	219	119
M12V	NEW 3 H.P. var/spd. router	437	255
TR12	Plunge router, 3 H.P.	354	175
C10FA	10" dlxe. miter saw	490	275
C8FB	8½" slide compound saw	859	469
FREUD LU91M008	- 8½" c/bld 48 tooth	58	45
C15FB	15" miter saw	745	399
FREUD LU85M015	- 15" c/bld 108 tooth	161	115

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34-445—34-444 Table Saw complete w/30" Unifence 799.00

33-150 8¼" Saw Buck 485.00

28-283F 14" Band Saw w/enclosed stand & ¾ H.P. motor 699.00

70-200 NEW 20" Drill Press 719.00

17-900 16½" Floor Drill Press 385.00

40-601 18" Scroll Saw w/stand and blades 599.00

DELTA #34-080 10" MITER BOX XTRA SPECIAL 199.00 List 289.00

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PIRANHA By Black & Decker

CARBIDE TOOTH SAW BLADE

Model#	Diameter	#Teeth	List	Sale
73-716	6-1/2	18	13.10	7.10
73-756	6-1/2	36	28.96	16.30
73-717	7-1/4	18	13.14	7.10
73-737	7-1/4	24	16.36	9.00
73-757	7-1/4	40	29.72	16.35
73-758	8	40	42.04	24.15
73-759	8-1/4	40	42.86	24.60
73-719	8-1/4	22	18.96	10.60
73-739	9	30	31.48	16.25
73-769	9	60	66.58	35.90
73-715	5-1/2	16	13.00	7.30
73-704	7-1/4	18	19.50	12.49

THE SPECIAL BLACK AND DECKER PIRANHA BLADE PRICES ARE BACK!!!

Model#	Diameter	#Teeth	List	Sale
73-740	10	32	33.20	15.95
73-770	10	60	61.46	29.95
73-711	10	50	65.08	29.95

JORGENSEN STEEL I-BAR CLAMPS

Model	Size	List	Sale
7224	24"	27.11	17.55
7236	36"	29.10	18.65
7248	48"	31.96	19.75
7260	60"	35.60	23.55

ADJUSTABLE HANDSCREWS BY JORGENSEN

Item No.	Jaw Length	Open Cap	List	Sale	Box of 6
#3/0	6"	3"	15.57	8.89	49.98
#2/0	7"	3½"	16.74	9.95	53.55
#0	8"	4½"	18.63	10.75	61.29
#1	10"	6"	21.30	12.99	71.49
#2	12"	8½"	24.45	14.89	81.89
#3	14"	10"	31.01	19.19	106.79
#4	16"	12"	40.30	24.89	145.65

STYLE 37 2½" Throat ¼"x¾" JORGENSEN

Item No.	Jaw Length	List	Sale	Box of 6
3705	6"	9.30	6.29	35.65
3712	12"	10.30	6.79	38.59
3718	18"	11.37	7.35	41.69
3724	24"	12.42	7.99	45.25
3730	30"	13.85	9.05	51.19
3736	36"	15.15	9.95	56.65

PONY CLAMP FIXTURES

Model		List	Sale	Lots of 12
50	¾" black pipe clamps	13.10	7.89	83.99
52	½" black pipe clamps	10.93	6.30	68.25

PANASONIC CORDLESS DRILLS

Model		List	Sale
EY6205B	NEW v/spd. 12 volt drill w/15 minute charger	390	219
EY6200B	NEW 2 spd. 12 volt drill d-hdle w/15 minute charger	350	198
EY6281B	NEW v/spd. 9.6 volt drill w/15 minute charger	350	198
EY571B	V/spd. 9.6 volt drill	239	139

BOSCH

Model		List	Sale
1581VS	Top hdle. jig saw	239	129
1582VS	Barrell grip jig saw	225	123
Bosch metal case for above jig saws		34	28
Bosch blade assortment for jig saws 30 of Bosch's best selling blades		25.99	
1942	Heat gun 650°-900°	99	69
3268	Heat gun 600° & 1000°	89	65
1272	3"x24" belt sander	279	165
1272D	3"x24" B.S. w/bag	299	168
1273	4"x24" belt sander	295	169
1273D	4"x24" B.S. w/bag	315	175
11-21VSR	Bulldog ¾" SDS rotary	339	189
1196VSRK	⅜" v/spd hammer drill	215	115
1198VSR	½" v/spd hammer drill	229	135
1608	5.6 amp lam trimmer	140	89
1608L	Same as above w/trimguide	145	92
1608T	5.6 amp tilt base trimmer	159	99
1609	5.6 amp offset base trimmer	205	122
1609K	Lam installers kit w/1609	295	165
Offset base, trimmer tilt base, trimguide, ¼" collet, collet nut, wrenches, hex keys and case			
1601	1 H.P. Router 25,500 rpm	165	105
1602	1½ H.P. Router 25,000 rpm	199	125
1603	1½ H.P. D handle router	223	137
1604	1¾ H.P. 2 hdle. router	219	118
1604K	Same as above w/case & access.	269	155
1606	1¾ H.P. D hdle. Router	243	142
3258	3¼" planer w/blade guard	210	129
3270D	3"x21" belt sander w/bag 5A	225	135
1273DVS	V/spd. 4x24 belt sander	339	189
1611	3 H.P. plunge router	349	195
1611EVS	"NEW" 3 H.P. elec. v/spd. plunge router	410	234
1651	7¼ circ. saw drop foot	179	99
1654	7¼ circ. saw pivot base	179	99
1632VSRK	Recip. saw 8.4A orb. v/spd.	225	135
3050 VSRK	"NEW" 9.6V v/spd. cdls. drill w/cse. & 2 batteries	235	129

BOSTITCH AIR NAILERS

Model		List	Sale
N80C-1	Utility coil nailer	730	435
N80S-1	Stick nailer	760	435
T36-50	Sheathing & decking stapler	550	334
N12B-1	Coil roofing nailer	725	435
N60FN-2	Finishing nailer	595	355
T31	Brad nailer	245	159

ELU BY BLACK & DECKER

Model	Description	List	Sale
3338	2¼ H.P. var/spd plunge router	387	265
3337	2¼ H.P. plunge router	356	245
3304	1 H.P. var/spd plunge router	261	185
3375	3½" universal planer 7.2 amp	280	195
3380	Biscuit jointer/spliner w/case	485	325
4024	3x21" var/spd belt sander	289	205
3303	1 H.P. plunge router	210	159
4023	3x21" belt sander 5.2 amp	261	195
4029	4x24" belt sander 9.2 amp	469	319

BLACK & DECKER

Model		List	Sale
1156	⅜" drill 0-2500 rpm 4 amp	96	55
2600	⅜" drill 0-1200 rpm 4.5 amp	125	85
2037	Drywall gun 0-4000 5.0 amp	160	95
1707	8½" crosscut miter saw	613	469
1703	10" miter saw w/73-770 blade	313	179
3157	Orbital var/spd jig saw	203	125
3153	Variable speed jig saw	195	120
3047-09	7¼" super saw cat w/brake	282	168
3048-09	8¼" super saw cat w/brake	297	179

BIESEMEYER FENCES

	50" commercial saw fence	329	285
	52" homeshop saw fence	249	225

JET TOOLS

Model	Description	List	Sale
JBS-14MW	14" band saw, 1 H.P.	482	385
JTS-10	10" table saw w/stand, 1½ H.P.	554	459
JTS-12	12" table saw w/stand, 1½ H.P.	630	509
JWS-18	½" spindle shaper w/stand, 1 H.P.	479	375
JJ-4	4" jointer, ½ H.P.	310	265
JJ-6	6" jointer, ¾ H.P.	465	379
JWP12	12½" bench planer, 2 H.P.	569	359
JWP12D	Dust chute for JWP12	45	22
JSG-6	6" x 48" belt & 12" disc sander, 1½ H.P.	634	475
DR1012	10" bench drill press, ½ H.P.	179	175
DR1458	14" bench drill press, ½ H.P.	279	259
DR1758	17" bench drill press, ½ H.P.	319	265
DR1458F	14" floor drill press, ¾ H.P.	369	325
DR1758F	17" floor drill press, ¾ H.P.	395	349
DR2501F	20½" floor drill press, 1 H.P.	655	539

RYOBI SPECIALS

Model	Description	List	Sale
R500	2¼ H.P. plunge router	326	155
TS251U	10" miter saw	392	179
TS251US	10" miter w/acc. kit & B & D 73-770 carbide blade	435	225
AP10	10" surface planer 13 amp.	620	358
RA200	8¼" radial arm saw	515	239
RE600	3 H.P. plunge router	398	215
R150K	1 H.P. plunge router w/cse.	206	105
BE321	3"x21" v/spd. belt sander	259	129

PORTER CABLE

690	1½ H.P. router 8 amp	225	125
691	1½ H.P. router D hdle	245	135
536	1½ H.P. speedmatic router	310	195
518	3 H.P. 5 speed router	560	339
520	3 H.P. 15 amp router	510	315
309	3.8 amp lam trimmer	135	85
695	1½ H.P. router/shaper	310	195
696	H.D. shaper table	170	119
351	3"x21" belt sander w/o bag	225	125
352	3"x21" belt sander w/bag	235	129
360	3"x24" belt sander w/bag	310	175
361	3"x24" belt sander w/o bag	290	169
362	4"x24" belt sander w/bag	325	185
363	4"x24" belt sander w/o bag	310	179
315-1	7¼" top hdle 13 amp circ saw	195	115
9315-1	315-1 comp. w/cse. & carb. bld.	225	127
517	7¼" pushhandle 13 amp	195	115
9617	617 comp. w/cse. & carb. bld.	225	127
314	4½" trim saw 4.5 amp	215	124
9548	X HD bayonet saw w/case	290	179
9629	Recip saw v/sp 8 amp	235	135
9627	Recip saw 2 speed 8 amp	225	125
555	⅜" H.D. v/sp. d. 0-1000 rpm	185	122
521	⅜" H.D. v spd. 0-1000 rpm	155	95
320	Abrasive plane 3 amp	160	109
9118	Porta plane 7 amp kit	335	185
7545	0-2500 drywall gun 5.2 A	159	99
7540	0-4000 5.2 amp gun	155	98
505	½ sheet pad sander	135	109
7511	¾" v spd. drill 5.2 amp	185	109
7514	½" v spd. drill 0-750	195	119
537	1½ H.P. D hdle router	325	205
7548	Top hdl jig saw 4.8 amp	230	129
7648	Barrel grip jig saw 4.8 amp	225	139
330	Speed block sander ⅛ sht	97	55
555	Plate biscuit jointer w/cse.	299	165
345	6" saw boss 9 amp	170	99
5060	"Stair Ease" stair templet	134	125
5061	"Stair Ease" hard wood	204	135
100	⅛ H.P. router	165	99
5008	Dovetail template kit	99.50	79
5009	Mortise & Tenon jig	54.95	49
7308	laminate slitter	190	129
5116	omni-jig	395	269
9547	TIGER CUB recipro saw	195	119
9850	12 volt cordless drill w/cse.	230	129
8500	Extra 12v battery	48	33
	NEW Tools By Porter Cable!		
7399	5.6 amp drywall cutout unit	120	75
7310	5.6 amp lam trimmer	145	89
7312	5.6 amp offset base lam trimmer	209	119
7319	5.6 amp tilt base lam trimmer	155	105
97310	LAM TRIM KIT W/STD. BASE, TILT BASE, OFFSET BASE, SLITTER BASE, GUIDE & CSE	330	185
7334	3.7 amp 5" random orbit sander 6000 rpm	205	119
693	1½ H.P. plunge router	280	165
97750	½" v/spd hammer drill w/cse	260	169
6931	Plunge router base	120	75

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Print this article

STICKLEY REACHES BACK

A 1990 vintage mission-style chair by L. & J. G. Stickley.

Ever since star Barbra Streisand paid $363,000 last year for an oak mission-style sideboard made by Gustav Stickley at the turn of the century, original Stickley furniture has become hot. Now, the line is even being revived.

L. & J. G. Stickley, Inc. of Manlius, New York, has started producing about 40 pieces of furniture in the same simple style that the company's founder and his brothers designed and marketed at the turn of the century. Because the mission-style pieces abandoned in 1922 were done in quartersawn white oak, that's what goes into the revival line, too.The company also remains true to the traditional joinery, such as pegged tenons, that made the furniture so durable.

Your parents or grandparents might even have owned some Stickley furniture. If you want to look over the resurrected line, you can obtain a catalog by sending a $5 check or money order to: *L. & J. G. Stickley, Inc., Box 480, Manlius, NY 13104.*

WAVING FIELDS OF WALNUT

Time was when you could count on an acre of good Iowa farmland to yield maybe 100 bushels or better of corn. But 100 walnut trees? Who's kidding whom?

For Jack Schultz and Ron Sippel of Effingham, Illinois, planting an Iowa farm to walnut trees isn't a joke; it's an investment. Last spring, they planted 132 acres they purchased in Floyd County with 94,000 tree seedlings, mostly walnut. In 60 or 70 years, when the best trees reach maturity, they'll be worth approximately $6.6 million, if calculated at today's value of about $500 per tree.

Meanwhile, until harvest, the property can't be taxed, and the owners get some repayment for the planting through government Conservation Reserve Program (CRP) and cost-share funds. Jack and Ron calculate that their heirs will reap a return that beats many other possible investments. Besides, there's nothing like watching an investment grow firsthand.

BYE-BYE BUTTERNUT

Butternut (*Juglans cinerea*), walnut's cousin and a favorite wood of carvers, could disappear from America's forests. Richard Smith, a plant pathologist with the U.S. Forest Service in Washington, D.C., reports that a deadly canker fungus threatens it.

"There doesn't seem to be any resistance to the canker," he notes. According to Smith, past research proposed crossbreeding butternut with more disease-resistant walnuts. However, no federal money has been allocated to continue the work. Individual trees suffering from the canker benefit from treatment with *benomyl*, a fungicide.

BARKING TOP TO BOTTOM

During the days when logging was done with animals in the Northwest, logs were debarked in the woods to reduce hauling weight. With a pry-bar called a spud, the top barker removed all the bark from atop a fallen log that he could reach. Then, it was turned over for the under barker to work on.

Illustrations: Jim Stevenson

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5 Hp, 3 Ph
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2 HP - 1 Ph $1628*	2 HP - 3 Ph $1560*
2 HP - 3 Ph $1675*	2 HP - 1 Ph $1560*

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‡VEGA Industrial Fence System standard on 2 HP Model 66

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You don't have to dress up to strip anymore.

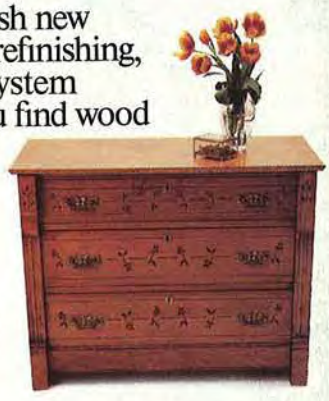
Now there's a paint and varnish remover that doesn't require protective clothing: Safest Stripper™ Paint and Varnish remover from 3M.

It's easy. It's effective. And, because it contains no methylene chloride, it has no unpleasant odors, no harmful fumes and it won't harm wood or skin. Just apply a thick coat and let it set to fully soften the old finish. It won't lose its effectiveness, even after sitting all night. So you can complete the entire project at once.

It's part of the wood refinishing system from 3M.

With a fresh new approach to refinishing, ask for the system wherever you find wood refinishing products.

Because when it comes to refinishing, 3M has you covered.



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